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Take Just a Moment to Read This Letter

You May Get a Different Idea About What It Costs to Run a Kompak Storage Water Heater

G. E. TATREAU
PLUMBING
HOT WATER AND STEAM HEATING

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The Long-Landreth-Schneider Co.,
New Brunswick, N.J..
Mr. Paul P. Runnels
Dear SIr:

Enclosed please find check for sixtyfour dollars for heater which I received from you some time ago.

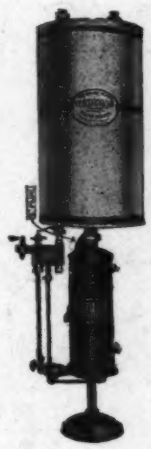
I have tried your heater and am well pleased with it .I have plenty of hot water when ever I wantit. I find it to be very economical. My gas bills are just one half what they use to be when I was using other automatic heaters.

Inthe Spring I may be in aposition to use some of your heaters.

Yours truly,
C.E.Tatreau Co.
Per E.O.Daniel-Mgr.

NO. 18

Water KOMPAK Heaters



DON'T hesitate—you can't make a mistake by ordering a KOMPAK—It's a wonder

THE LONG-LANDRETH-SCHNEIDER CO.

NEW BRUNSWICK NEW JERSEY

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The Gas Machinery Company

Cleveland, Ohio

COAL GAS PLANTS **WATER GAS PLANTS**

BY-PRODUCT MACHINERY

NOTE:—

This advertisement is only to keep
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U. G. I. Vertical Retorts

The best system of coal carbonization
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Figures prove this and the guarantees of

THE UNITED GAS IMPROVEMENT CO., Philadelphia

Back it up

AMERICAN
GAS ENGINEERING JOURNAL

FORMERLY THE AMERICAN GAS LIGHT JOURNAL

Vol. CVIII, No. 23 NEW YORK, JUNE 8, 1918 Whole No. 3144

Type of Oven Used for Japanning Adapted to Bakery Use and Output of 10,000 Loaves of Bread a Day Obtained

How the Gas-Fired Oven Makes for Better Quality of Bread—Importance of Proper Color in Product—Use of Sugar With Coal Fired Ovens to Obtain It Eliminated With Gas Oven

Tales have been told in the JOURNAL of industrial fuel installations that have been sold by this or that means. This is the story of an installation that was sold initially by a picture.

Throw your mind back to an automobile-parts drying oven. So many have been sold and so extensively have they been pictured that the gas man should be able to visualize the usual type instantly. The installation described here is practically the same thing, but it is used to bake bread—10,000 loaves per day. And it bakes them efficiently—so efficiently that the baking company's superintendent of manufacture, Herman Porzig, who has eight coal-fired Dutch ovens working almost alongside of it, swears by it, and asserts that visiting bakers from nearby towns declare it the best thing they have ever seen.

WHY THE COAL-FIRED OVEN

The industrial fuel gas man, Edgar Atherton, of the

BREAD FED IN PANS INTO ONE END OF OVEN

COMES OUT PERFECTLY BAKED AND COLORED AT OTHER END

SIDE VIEW OF OVEN GIVING IDEA AS TO ITS SIZE AND SHOWING PIPING WHERE PREHEATED AIR MIXES WITH GAS

Public Service Gas Company of New Jersey, who made the sale, is inclined to be non-committal in regard to the performance of the oven. But he is following the installation up closely, and he is very much interested in those bakers who come from Newark, Trenton, Camden, etc., to take note of how the Consumers' Baking Company, of Paterson, has gotten the jump on them. He is confronted with an opportunity that comes but seldom to the industrial fuel gas man—that of discharging his proper obligations in assisting his client to get the best possible operating results from the installation he has sold him, and at the same time prepare the way for some of his co-workers in the same company to affect similar sales, it being remembered that Newark, Trenton, Camden, etc., from which came those visiting bakers are also supplied with gas by the Public Service Gas Company. Besides, Mr. Atherton cannot see any reason whatever why those eight coal-fired Dutch ovens that are still working in the Consumers' company's plant should continue to burn coal when gas is so much superior as a bread-baking fuel.

The gas-fired oven that has been installed is a conveyor type, 22 ft. long, 6 ft. 8 in. wide by 8 ft. high. It is the first of the type used on manufactured gas, and is provided with four pipe burners extending the full width of the oven and spaced about 5 ft. apart. The gas is premixed with preheated air in a mixing chamber outside the oven, and is under pressure supplied by a Roots positive pressure boiler. The air is preheated by having the inlet pipe run through the heated oven on its way to the mixing chamber. The walls are of galvanized iron, with a 3-in. thickness of asbestos insulation. It is set on a wood floor — a very important point—with only a layer of asbestos between the boards and the floor of the oven.

Some Inside Data on Baking

Herman Porzig, the baking company's superintendent of manufacture, explains why the use of gas as a fuel makes for a better quality of baked bread. Color is an essential to merchandisable bread. In the Dutch type of coal-fired oven it is easy enough to get the desired shade of brown in the early hours of baking. But, as is known generally in the coal-fired oven, the heating up is done before the baking, the baking being done from the heat retained in the oven walls. Thus as the day goes on the heat becomes less and less. The desired shade of brown is not, without artificial assistance, obtained in the same length of time as in the earlier runs. This artificial aid consists in the addition of increasing proportions of sugar to the dough mixtures as the oven cools. Otherwise it would be necessary to leave the bread in the ovens longer, which would tend to dry it out. And the necessity of adding sugar is objectionable. It is obvious that bread made late in the afternoon would be sweeter than that made in the morning. "And," as Mr. Porzig says, "who wants sweet bread?"

The heat in the gas oven, of course, does not vary, as the fire burns during the whole day's work. Thus no sugar is added and there is no variation in the time it takes to give the product the proper color.

Even if gas should not be, as a general thing, preferable to raw fuel for baking, ovens of this kind could be sold as an emergency provision. Generally the Friday demand for bakery products is double that of any other day. Here is where the gas-fired oven fits in with its quick heating-up ability, likewise in the case of other sudden and unexpectedly large demands.

Here are some figures in regard to the operation of this installation:

Gas consumption per 100 loaves of bread:
Trial run March 7-14, 1918, six days.
Number of loaves baked, 56,448.
Gas consumed, 51,200 cu. ft.
Gas consumed per 100 loaves, 90.7 cu. ft.
Size of loaf, 1 and 2 lb.
Average weight, 1.3 lb.
B.t.u. gas, 600.

There is a sales story connected with this installation. The industrial gas man lived near this baking plant. He made a habit of calling in on his way to work. His persistence was rewarded when he learned one day that four new coal-fired ovens were to be installed.

A Long Road That Has No Turn

He knew that this was his entering wedge. None of the existing installations thereabouts seemed to quite fit the situation. He dug into the files and found some literature in regard to the type finally selected. To him, though this type had not been used on manufactured gas so far as he could learn, it seemed made to order for the particular situation.

He looked it up and convinced himself that it would give satisfactory results. But when he approached the baking company all he had to sell it on was an illustration and the data in his head. He did not have a near-by existing installation that he could show to them.

But he got them interested enough to accompany him to the plant of the oven manufacturer for a demonstration. This satisfied them enough to induce them to take a trip to Cleveland where a similar installation was actually working on natural gas. This convinced them and the sale was made, though it took a year altogether to accomplish it.

How Far Does a Belt Slip?

(Copyright, 1918, by W. F. Schaphorst.)

Not long ago I read this statement in a technical publication: ". . . and it is obvious that the chief wear on belts is occasioned by their swift curling and uncurling motion around the pulleys . . ."

It is true that this is possible in belts that contain no internal lubricant. If the belt is dry, the fibers within the belt rub against one another with greater friction, and consequently the wear will be greater for the same reason that an unlubricated bearing will wear more rapidly than will a lubricated one. This holds true even with ball bearings. But if the belt is properly treated with a preserving lubricant similar to the natural lubricant that is in the hide while on the animal, the internal wear is very small indeed. Experience with dry and treated belts bears out these statements, and I believe the author of the quotation given above will agree with me.

While thinking this over, though, the fact developed that there has been no formula in text-books or elsewhere for computing the distance a belt slips or creeps in a given time—a year, for example. I thought it might be because the total slip for a year is a small amount—not worthy of much thought—but after doing a little rough figuring my eyes opened to the astounding figures that were produced by my lead pencil.

Let us take an example. A 4-ft. pulley rotates at the rate of 250 revolutions per minute. Its belt does not slip, but the creep is 2 per cent. It is used ten hours per day during 300 working days in the year. How far does it slip per year?

Multiply the 4 by 3.1416 and then by 250, and we find the pulley travels 3,141.6 ft. per minute. Multiply this by 2 per cent and we find that the belt creeps (this is sometimes erroneously termed "slip") about 63 ft. per minute. That immediately looks like an almost impossible amount, but it is true nevertheless. This is equal to 3,780 ft. per hour, 37,800 ft. per ten-hour day, or 11,300,000 ft. per year of 300 working days—a total of 2,140 miles.

Two thousand one hundred and forty miles of rubbing even on a smooth pulley is considerable. And if there is any slip on the pulley in addition to the creep the matter is all the more serious.

It must be remembered, however, that a given point on the contact side of a belt is not in contact with the pulleys all the time. During each complete trip of the belt around the pulleys the given point is in contact with one pulley for a short time during which there is a rubbing action to some extent, then the given point is not in contact with anything until it reaches the next pulley, when it again rubs. The greater the distance between the shafts, then, the less the yearly slip or creep of the given point. Thus if we could connect a driving pulley on the earth with a driven pulley on a distant star, a given point on the contact side might not touch a pulley for several years, even when running at the speed of the belt cited in the example above. Such a belt should last millions of years, were the length of life dependent solely on friction. A short belt, on the other hand, is subject to greater punishment because the given point comes in contact with the pulleys frequently.

To aid in computing the slip plus the creep of a point, taking into account the radii of the pulleys and the distance between shaft centers, the writer has developed the following rule:

Multiply the "total yearly slip of the belt" as obtained above by 3.1416, and then by the sum of the radii of the pulleys in feet. We will call this amount "A."

Now multiply the distance between shaft centers in feet by 2, and to it add the product of 3.1416 multiplied by the sum of the pulley radii in feet.

Divide "A" by this sum, and the quotient is the total number of feet a given point slips and creeps in a year's time.

For example, let us assume that in the problem above the distance between shaft centers is 30 ft. and the pulley radii are 1.5 ft. and 2 ft. respectively. What is the total creep of a given point on the contact side of the belt in a year's time?

Adding the radii we get 3.5 feet. Multiplying by 3.1416 we get 11. Multiplying that by 2,140 miles we get 23,540 miles, which we call "A."

Now multiplying 30 by 2 we get 60. And 3.5 by 3.1416 we again get 11. Adding 11 and 60 we get 71.

Lastly, dividing 71 into 23,540 miles we get 332 miles as the total slip of a given point per year.

For the convenience of those who prefer rules of this kind in the form of an algebraic equation we have this:

Yearly slip plus creep of a given point on a belt =

$$3.1416\ D\ N\ S\ M = \frac{(R + r)\ 3.1416}{[(R + r)\ 3.1416 + 2\ L]\ 5280}$$

Where

D = diameter of the driving pulley in feet.
N = r. p. m. of the driving pulley.
S = slip plus creep of the belt.
M = number of minutes belt is operated per year.
R = radius of driving pulley in feet.
r = radius of driven pulley in feet.
L = distance between shaft centers in feet.

Use Old Tubular Boiler for Light Oil Still at Des Moines Works

Henry Clay Adams Furnishes Notes on Toluol Recovery in Plant in Operation Since July 1916 —Light Oil Recovery Dependent Upon Operating Conditions and Quality of Materials Used in Gas Making

Toluol is a commodity which all those interested in the manufacture of gas have heard more about during the past three years than ever before in the history of gas manufacture, declared Henry Clay Adams, of the Des Moines Gas Company, in a paper presented at the recent annual meeting of the Iowa District Gas Association.

The plant at the Des Moines works has been in continual operation since July, 1916 recovering toluol from the water gas manufactured at the works, and in addition has recovered the toluol content of the light oils recovered from the tar manufactured. The holder oils on the holders in 1916 also contributed a large amount. Drip, holder and light oils from outside plants are also refined for their toluol content.

Outline of Process

That group in the gas known as the illuminants or the benzene group contains light hydrocarbons, viz., benzene, toluene and xylene, which are the three oils that are important in connection with the operation of the plant.

The water gas, after it is purified, is passed through scrubbers filled with trays; here it is washed by means of a wash or absorbent oil. This oil absorbs the benzene group from the gas, or, as it is more generally known, the gas is stripped. The mixture of straw oil and the benzene group, known as the benzolized oil, is run off into a storage tank. It is then pumped through the light oil still system, where the temperature is so regulated that the lighter benzene group vaporizes and passes out of the still through condensers to a light oil storage tank. The wash oil or debenzolized oil from which the benzene group has been removed is returned again to the scrubbers. In addition to this, another pump is circulating the oil continually from the benzolized tank through one of the two scrubbers. The scrubbing and recovery of light oil is a continuous process, scrubbing ceasing only when the exhausters are shut down due to full holders.

The light oil thus made is placed in a fractionating still having a capacity per charge of 1,600 gal. Here, by means of cuts, the oil is divided into its three main constituents—crude benzol, crude toluol and crude xylol. The vapors are distilled over from the still, still column, planer and condenser in the order named, benzol being the most volatile and xylol the least. Due to the fact that toluol overlaps benzol and oxylol overlaps toluol, there are five products distilled which, according to our nomenclature, are known in order of distillation as "B," "BT," "T," "TX," "X."

The "B" or crude benzol is stored for enriching purposes or for sale.

The "T" or crude toluol and "X" or crude xylol are stored for sale, although xylol may be used at times for enriching the stripped gas.

The "BT" and "TX" oils, known as intermediates, are put to one side until enough of either one has accumulated to make what are called "BT" and "TX" runs in the fractionating still.

Holder, drip and other light oils are placed in their turn in the fractionating still and are refined in the same manner.

Apparatus

The two scrubbers were originally installed on the outlets of the two 8-ft. 6-in. sets at the "works"—they were removed and lengthened to 42 ft. in height—their diameters being 8 ft. 6 in. In these scrubbers were placed wooden trays whose functions are the more intimate mixing of the gas and wash oil, the former entering the scrubbers from the bottom, the latter in the top. The two scrubbers are in series with one another.

The tanks for operating and storage were a very important item and were most difficult to procure. There are at present sixteen tanks ranging in size from 1,000 to 14,000 gal. capacity. Twelve of these tanks are buried underground; nearly all of the tanks were second hand.

The light oil still itself was an old horizontal return tubular boiler; the tubes were removed, a steam coil and live steam spray inserted and patches put over each end. The fractionating still is a standard 1,600-gal. still equipped with a steam coil and live steam spray.

There are two still columns or dephlegmators—each are composed of twenty-two sections—the only difference between the two being their diameters—that for the light oil still is 42 in. in diameter, while the column on the fractionating still is 28 in. in diameter.

In addition there are planers and condensers of both open and closed type. Use is made of heat which otherwise would be wasted in cooling some of the oils by passing them through heat exchanges, thereby saving both steam and water.

The pumps are standard Davidson units that give perfect satisfaction.

General Description

As temperatures play a very important part in the operation of the plant, it is necessary to have reliable temperature controls installed at points where temperatures are to be regulated. The regulators in service at the present time are those made by the Tagliabue Manufacturing Company and Sarco Engineering Company.

The light oil content of a gas depends upon its

manufacture, and by manufacture I include the operating conditions and the quality of the material employed in gas making.

The benzene group is manufactured or introduced into water gas by the "cracking" process in the carbureter, i. e., the mixing of the blue gas from the generator with the gas oil sprayed into the carbureter upon the checker brick at a high temperature. In water gas manufacture the heats, the amount of gas oil used per 1,000 cu. ft. of gas made and the condition of the checker brick play the most important part in the recovery.

At Des Moines during the year 1917 the heats on the sets averaged about 1,350 deg. at the top of the superheater and 1,425 deg. at the base, while for every gallon of gas oil used during the year there was a recovery of 0.0284 gal. of crude benzol and 0.0221 gal. of crude toluol.

As stated previously, the light oils are removed from the gas by a washing or scrubbing process. The oil which is used for this purpose is called straw or absorbent oil; its chief characteristic is that when the oil is subjected to a distillation test with steam at atmospheric pressure not more than 5 c.c. of oil shall distill over from a total amount of 500 c.c. when collecting 500 c.c. of water. The reason for this is obvious when it is considered that the lighter hydrocarbons are removed from the so-called benzolized oils by steam distillation in order to convert it into debenzolized oil or absorbent oil to be recirculated in the system.

Creosote oils and light tar have been used. The British used tar to scrub gas quite considerably right after the outbreak of the war, because they had to have the toluol without delay. In numerous instances this method of stripping the gas caused naphthalene troubles to develop. Gas oil, I believe, has been tried, but in using it there is the danger of paraffin entering into the toluol. When nitrating pure toluol the presence of paraffin causes an emulsion which makes the toluol worthless for the preparation of T.N.T. for high explosives. The limit of paraffin in C.P. toluol is, I believe, 2 per cent.

One of the troubles experienced at Des Moines in connection with the wash oil is the continual forming of a product called crude para-cumeron resin, which is collected from the gas by the absorbent oil. Para-cumeron, when first recovered, is an emulsion containing straw oil, para-cumeron and water; the separation is effected as follows:

The crude material is run into a shallow tank and allowed to settle, provision being made to heat or cool the mixture as desired. The water and para-cumeron settle to the bottom while the clear straw oil rises to the surface. It is then skimmed off and returned to the system, while the para-cumeron is drained off into rough tanks, which are merely holes dug in the ground, which in turn are lined with rough boards. Here the para-cumeron has further chance to settle, and in time more straw oil can be recovered, until finally the tank contains only a very thick mixture of para-cumeron—the small percentage of water seeps away into the ground.

It is necessary to remove this para-cumeron in order to obviate any troubles in cold weather, when it may be necessary to shut down the plant for repairs. A pocket of para-cumeron may collect in a tank and suddenly the material may be drawn into the suction line of a pump and clog it. During the necessary shut down I have known this material to harden when it cools and become brittle like shellac. The application of heat in the form of live steam softens it and turns it into a liquid so that it can be removed into the settling tank.

Light Oil Still System

The light oil still system proper consists of the following apparatus:

From the storage tank the oil is pumped through a heat exchange where the oil is heated by means of the hot debenzolized oil flowing from the still; the oil then enters a preheater, which is a tank containing baffles and steam coils; continuing, the oil flows to the still column or dephlegmator, whence it flows to the still wherein are contained live steam sprays and coils.

The vapors of light oil driven off by the heat pass up through the still column to the planer and condenser to the light oil storage after passing through a separator, where the water which comes from the steam spray is removed.

The debenzolized oil in the meantime flows through the above-mentioned heat exchanges and coolers to a storage tank and is again pumped to the scrubber.

The whole process is carried on at a low pressure, which never exceeds 5 to 6 lb. gauge pressure unless the temperature controls fail to work, in which case safety valves take care of pressures in excess of 15 lb. gauge. The temperature in the still is carried high enough in order to remove all of the benzol, toluol and xylol in the form of light oil.

Fractionating Still System

I will now describe the actual operation of the fractionating still by showing the steps taken when running a light oil charge.

With the still full the temperatures are gradually raised until the benzol starts over—the heats are held below 180 deg. Fahr., which is the benzol cut, at the outlet of the planer; this is necessary to keep the toluol from distilling over with the benzol. The oil is run directly to the benzol storage tank. When the oil ceases flowing with the temperature at 180 deg. Fahr., the heats are gradually raised and the oil diverted to drums. The oil at this point is a mixture of benzol and toluol, or "BT," as it is called by the operators.

By watching the temperatures the second cut can be made when that oil which is being distilled over from the planer shows a high percentage of crude toluol. This can be regulated by laboratory work, with the result that the amount of intermediates can be cut to a minimum. However, at Des Moines this laboratory control is not always practical, due to the fact that the cuts may come in the night time; in this case the operator, by experience, can rely on his sense of smell, there being a distinct difference in smell between benzol, toluol and xylol. The cut between the toluol and xylol is determined in the same way.

Laboratory Work

Holder, drip and other light oils are distilled in a similar manner.

A careful record is kept of every run turned out by

the fractionating still and the residue remaining from oils shipped in by outside companies. The actual amount in gallons of all oils are carefully noted after the oils are analyzed after they leave the still.

The laboratory need not be elaborate, and, in fact, for a plant making crude materials is very simple as to details.

The equipment should include: Distilling flasks, good chemical thermometers, glass graduates, copper flasks for distillation tests, glass dephlegmators, bunsen burners, stands, etc.

All runs on the fractionating still are numbered and are entered in the log book in the laboratory, where the actual results for all runs are noted after analyzing the various samples of oils for each separate run.

The light oil made each day is sampled and analyzed, while tests should be run on the debenzolized oil occasionally to make sure that the light oil still is removing all of the light oil from the benzolized oil. It is also advisable to run absorption tests on the rich and scrubbed gas to check the efficiency of the scrubbers.

Results

I give below some of the physical results obtained during the year 1917:

Total crude toluol manufactured, 97,640 gal. Of this total 68,591 gal. and 6,942 gal. were recovered from the gas and tar, respectively, the remainder, or 22,107 gal., were recovered from holder, drip and light oils from outside sources.

Total crude benzol manufactured, 105,573 gal. Of this total 87,940 gal and 3,592 gal. were recovered from the gas and tar, respectively, the remainder, or 14,041 gal., were recovered from oils from outside sources.

The crude toluol and crude benzol recovered per gallon of gas oil used amounted to 2.21 and 2.84 per cent, respectively.

Effect on Quality of Gas

The effect of scrubbing gas for the removal of light oils, of course, reduces both the heating value and candle-power. This reduction depends upon many variables, original quality of the rich gas, its manufacture, and, finally, the efficiency of the scrubbers. By tests run here at Des Moines the reduction of the heating value varies from 15 to 30 B.t.u., while the candle-power drop varies from 4 to 9. This great difference shows how the manufacture of the gas itself plays an important part, conceding the point that the efficiency of the scrubbers remain constant.

Upkeep of Apparatus

From time to time the various pieces of apparatus must be cleansed of the various scales that collect. I have found benzol and xylol useful for such a purpose. The heat exchanges, coils and lines through which the debenzolized oils run are washed out at stated intervals by pumping xylol through them or allowing the xylol to stand in the pipes for a time before draining.

The coil in the preheater continually collects a scale due to the passage of benzolized oil. This coil must be removed periodically for a thorough cleaning, although between the times of these cleans it has been found practical to cut out the preheater from the circulating light oil still system by by-passing it, filling it with xylol and allowing it to stand after heating the oil to about 180 deg. Fahr. In this way the xylol will soften and dissolve the coked scale.

Due to its peculiar construction the still column is very difficult to clean; there is one small door to each section, which also handicaps one who may be cleaning out the interior. Each section is connected together by means of long nipples, which extend to within ¾ in. of the bottom of each section; hard scales collect directly beneath the nipples that can be removed by means of a sharp-pointed tool, other stoppages due to thickening of the oil can be obviated by running some benzol or xylol through the column.

Open condensers can be easily cleaned of the scale which collects because of the use of river water. This scale can be easily chipped off or removed by kerosene.

The gas mains leading from the outlet of the scrubbers through the station meters to the storage holders contain the stripped gas. To prevent any deposits of naphthalene due to the absence of the benzene group in the gas, it is the custom to pump a quantity of benzol into the secondary scrubber so that the stripped gas may pick up the benzol, which in turn would dissolve any naphthalene that may have collected. As a precaution this is done about once every ten days, although no trouble has been experienced with naphthalene.

The life of the steam coils is very uncertain. Take, for instance, the coil in the fractionating still; it probably sees harder service than any of the other coils because of the extremes in temperature to which it is subjected. It has now been in service for nearly two years, or a total of about 730 runs for the still, and is yet in good condition. The repairs to the fractionating still system for the past two years have been practically nothing.

The condenser coils appear to have a shorter life, one already having been replaced last March. This coil was badly corroded and worn, both on the inside, which is exposed to the vapors of light oils, and on the outside, which is exposed to the action of river water.

Danger of Fire

The danger of fire is not great, due to the fact that there are no sources of danger within the yard in which the plant is situated with the exception of gas lights and bunsen burners in the laboratory, which is at a distance from the stills. Electric lights with vapor-proof globes are installed in and about the still and pump house.

There are a number of Pyrene fire extinguishers provided, together with sand and one 40-gal. Firefoam engine for emergency. The former have been found very useful in the laboratory, due to unavoidable small fires caused by the breakage of small distilling flasks containing the various oils for analysis over the bunsen burners. Due to the provision of asbestos sheeting, shallow tin trays and the Pyrene extinguishers several nasty blazes have been very quickly extinguished.

Poor Housekeeping Responsible for Most of the Fires in Gas Plants

H. A. Johnson Enumerates Means of Eliminating Fire Hazards—Methods Employed by Omaha Company to Protect Its Property

While our country is at war, it is very necessary that we conserve our property and resources. Especially is it important that public utilities, such as railroads, water, gas and electric plants be well guarded to prevent damage or destruction by alien enemies, declared H. A. Johnson, of the Omaha (Neb.) Gas Company, in a paper presented at the recent annual convention of the Iowa District Gas Association. When the United States first entered this war, most of these places were guarded by National Guardsmen, but it has now become necessary to employ civilians for this work, and the selection of these men should be done with the utmost care.

Each man should be required to pass a physical examination by the company's physician, and an inquiry should be made of his past history in order to decide whether or not he is qualified for the position. As much care should be followed in selecting a night watchman as in securing a bookkeeper or an engineer. He should not be overburdened with other duties, such as firing boilers, doing janitor's work, or be given work which may prevent him from giving undivided attention to observation of the plant under his charge.

Watchman's clocks should be installed and the stations so located that the watchman may cover the entire plant at least hourly. In addition, he should be instructed in the operation of all means of fire protection and manner of extinguishment. Floodlights, or other lighting, should be installed around the plant in order to help the watchman in his work. All entrance gates to plant should be kept locked and persons should be admitted to the works only by first applying at the office.

Why Insurance Doesn't Solve the Fire Problem

The present war has already done, and will continue to do, more toward curtailing "American extravagance" than years of teaching and preaching could possibly have done. Ours was a country of prosperity and plenty, and it was almost impossible to teach or impress upon our comfortable people the importance of conserving our resources from a prolific destruction by fire.

Preventable Fires a Public Dereliction

The State fire commissioner of Nebraska has stated that "insurance" seemed to solve the whole "fire" situation. Business men, from the smallest up to the largest, rested easy and unmoved in the fact that their property was insured, and therefore they had nothing to fear from "fire." Now, with our scarcity of food, lumber, grain, and all the necessities of life, it is dawning upon our people that insurance money cannot *replace* that which has been destroyed by fire; it cannot bring back to its material form that which has been reduced to a heap of ashes. Insurance reimburses with money the cash value of what has been destroyed, but if there is a scarcity of the commodity destroyed, dollars cannot purchase or create it.

President Wilson and Mr. Hoover have both repeatedly warned and pleaded with the nation to curtail our tremendous fire losses. President Wilson says: "Preventable fire is more than a private misfortune. It is a public dereliction. At a time like this of emergency and of manifest necessity, for the conservation of national resources, it is more than ever a matter of deep and pressing consequence that every means should be taken to prevent this evil."

Early last spring, after the United States declared war upon Germany, the National Board of Fire Underwriters placed at the disposal of the Government its entire amount of detailed information regarding fire prevention and fire protection, together with the individual service of the organized fire insurance companies, and through the consent of these various companies, their State and special agents throughout the entire United States volunteered their services to the Government for the inspection and safeguarding of property against fire. These honorary inspectors, together with the regular paid inspectors of the Fire Commission Department in Nebraska, have made a most thorough canvass of the State, and there is scarcely a town of any size that they have not inspected during the past year. Practically every elevator throughout the State has been inspected.

Manufacturers, business men and citizens generally throughout the State have been most anxious and willing to receive suggestions and to comply with orders and corrections asked for by these inspectors. Never before have merchants and business men been so cautioned and instructed regarding fire hazards. Carelessness, to a great degree, has been corrected, and negligence in providing ample fire protection has been brought to the attention of citizens in a manner that will surely bring good results.

It can be seen from the foregoing that it is the duty of each employer to do his part to reduce fire hazards and to provide ample protection for fighting fires. The fire hazards in the gas industry, with very few exceptions, are similar to these experienced by other industries.

Individual Carelessness the Greatest Fire Hazard

Statistics prepared by the National Board of Fire Underwriters show that but seven-tenths of 1 per cent of the fires in New York during the year 1915 were caused by gas—natural and artificial—and all of these were classed as strictly preventable. It therefore follows that individual carelessness is the greatest fire hazard.

During the past five or six years I have devoted considerable time in trying to reduce the fire and accident hazards in our plant to a minimum. We have found it very beneficial to make an inspection of all our office buildings, storerooms, garage, works and yards about once every month, and also to make frequent inspection of the work carried on by main and service gangs on the street. A written report is made for each depart-

ment, showing location and nature of hazard found, together with a suggestion as to disposal of same. These reports are referred to the superintendent of each department for his immediate attention.

These inspections have resulted in getting the foremen and men in charge of the various buildings, etc., to take great pride in keeping their place clean and in good order. In my own experience, I have found that poor housekeeping is responsible for most of the fire and accident hazards. If the floors are clean, material piled in an orderly manner, waste paper and waste placed in waste cans, it is almost impossible to find a hazard present.

I think you would all be surprised to see what effect similar inspections would have on the appearance of your plants, especially after the employees become familiar with the various hazards. These inspections should be made by some person who is not on the ground every day, as he will be more apt to notice the little things which might, if neglected, eventually cause a serious accident or fire. The men in our plant occasionally call my attention to hazards they have noted, and I find it quite important to give each suggestion immediate attention, as it encourages the employee to be on the lookout for further hazards, thus arousing his interest in safety work.

In the gas industry, as well as in other industries, the common causes of fire are spontaneous combustion of oils, paper, waste, benzene, rubbish, oily rags, paint materials, and *thoughtless* handling of matches, gas fires, cigarettes, chemicals, electricity, pipe ashes and cigar stumps. Many fires which have been started from these various causes have been extinguished by having on hand in the plant ample means of fire protection and not depending upon the arrival of the city fire department. Considerable thought and care should be given in providing fire protection around a gas works where fires are liable to start from oils and coal piles.

I will try and outline the most important things which are required to keep a plant well protected in case of fire, based upon my own experience and on information gathered from many sources.

Yard Hydrants

Care should be taken that threads on hose outlets correspond exactly to the threads on the public fire department hose, or, if there is no public fire department, threads should correspond to the hose couplings at nearest mill or factory. Inspection should be made frequently to observe if any hydrants are leaking, and if so, require immediate repairs; also see that hydrant stems and caps are well lubricated. All hydrants should be flushed out thoroughly at least yearly.

It is most important that the hose and equipment shall be properly and conveniently arranged; also there is grave danger of a disastrous delay in getting hose streams promptly upon a fire. A hose house is ordinarily required over each yard hydrant.

At least 100 ft. of hose should be coupled and attached to one hydrant outlet and play pipe attached to hose, ready for use in case of emergency. One hydrant wrench should be on hydrant and an extra wrench hanging in hydrant house. All hose should be tested for tightness at least once a year at from 100 to 125 lb. static pressure. Water should be run through all cotton rubber-lined hose once or twice a year to retard deterioration. Always drain all hose properly and dry thoroughly before placing the hose in the house.

The roofs and doors of hose houses should we weather-tight and the houses kept clean and free from rubbish. Inspection should be made to see that the doors of hose houses are high enough above the ground so as not to be obstructed at any season of the year. The words "Hose Cart," in large, prominent letters, should be painted upon the door of each house.

Instructions Covering Fires and Fire Drills at Gas Works

Fire drills should be held frequently at the gas works and printed notices posted, giving instructions to the men as to their duty in case of fire. In our gas works we have two hose houses and hose carts, one located by the purifying house and the other by the engine room. We also have four hydrants, one in each hose-cart house, one in the oxide yard by coke shed, and the other near works office. There are also two city hydrants located just outside of the works yard. We have divided our property into two fire districts, one district taking in the territory located in works proper, except oil storage tanks and relief holders, the other taking in oil storage tank, adjoining property and holders.

Signals for fires are given by the engine room whistle. One long whistle and two short ones indicate fire is in District No. 1, and one long and three short whistles for District No. 2.

For all alarms sounded during the hours of the yard force all men are to respond, with the exception of the manufacturing force, unless told to shut down, in which case the engineer on duty will take charge of boilers as well as the engine room.

For all alarms sounded after the hours of the yard force the machines are to be shut down immediately, and the engineer is to take charge of boilers as well as engine room. All other men are to respond to alarm.

Six men are assigned to one hose-cart house and seven to the other, and all men not assigned are instructed to respond to fire alarms at the different hose houses and offer assistance wherever possible.

Carbon Tetrachloride Extinguishers

For fires around holder tanks, oil storage tanks, tank cars, tar plant and other places, carbon tetrachloride extinguishers are more effective than water. These extinguishers are located in works office and outside of generator house. We recently increased our supply of extinguishers after being advised of the results obtained by two men extinguishing a fire around a holder tank when holder oil caught fire at a neighboring gas plant. The fire department was unable to extinguish the fire with their equipment, and two employees, each equipped with an extinguisher, started in opposite directions around the holder and played a stream upon the flames until they met, when the fire was entirely out. Although the operation of these extinguishers is simple, and instructions for operating are clearly written on the outside, one of our men recently twisted the handle on one until it broke. This experience showed us the importance of personally instructing each man as to the operation of fire extinguishers, and steps were taken to do this immediately, and we were surprised to

(*Continued on page* 559)

Emphasizes Importance of Eliminating Even the Smallest Leaks in Obtaining Manufacturing Results

Thomas Rice Points Out Savings That Can Be Effected—Getting the Neighborhood Farmer to Use Gas Works Tar for Painting, Disinfectant Etc.—The Value of Attractive Plant Surroundings When the Engineer Visits to Make a Valuation

In these days of abnormal prices of coke, oil, coal and other materials entering into the manufacture of gas, the strictest economy must be practiced in every line. We cannot afford to waste even the smallest amount of any material. It is surprising what the small amount saved each day totals at the end of the month, declared Thomas Rice, general manager of the Gage County Light & Power Company, of Beatrice, Neb., in a paper presented at the recent annual convention of the Iowa District Gas Association.

One of the crying needs of the day is coal conservation, yet how many pounds are wasted through faulty covering and leaky piping. Pipe covering even at today's prices will more than pay for itself in a short time, but how many of us realize how important it is to absolutely cover every inch of exposed steam piping? We, as a rule, cover the main lines, but the small lines are the ones neglected and which should be covered. It is just as important to cover a ¾-in. steam line as a larger one.

Main Header Valve Open with Plant Not in Operation

Another point I wish to bring out is, most small plants run just part of the day, the boiler fire banked while the plant is not in operation, but the main header valve open. We have carried out some interesting experiments banking with the valve closed and open, and it was astonishing how much the loss really is from radiation and what a difference it made to close the valve. If your plant man has not been closing this valve when he shuts down make him do it, and watch your coal cost decrease.

We have a very successful, we believe, fuel economizer at the Beatrice plant utilizing the entire waste heat from one water gas set. The superheater is tapped on the side near the top and an 8-in. saddle bolted on, the piping, which is of 8-in. flanged cast iron, is run on an angle of 45 deg. direct to the boiler; connection is made in the side of the firebox, a quick-opening valve in the line is used during the blows and runs being open while blowing and shut when making gas. The cap on top of the machine is never opened. Since the installation several years ago no coal has been purchased. We find that we can keep our steam up to the required pressure while running, but we also use in connection with the waste gas the waste matter of clinker from the set; in other words, after thoroughly sorting out the largest coke, the balance, clinkers and all, is put into the boiler firebox; this not only consumes all the coke present, but also retains sufficient heat to keep steam up to required pressure when running, but stores up sufficient to keep the boiler hot when set is not in operation. In plants where a steam engine or turbine is used on the blower I do not believe the waste gas alone can be depended on, but as we have electrically connected blowers we have no trouble in getting sufficient steam for our needs.

Marketing the Tar Locally

The tar question is also a point to think about; it has been my experience that the small manager does not pay much attention to this useful by-product, but here is a source of revenue that should not be overlooked. A thorough advertising campaign, especially among the surrounding farms, will bring good results once you get a farmer started using tar as paint, preservative, disinfectant, etc.; and as he finds out its value you will find him ordering time and time again. Your local telephone and electric companies are sources of disposals of your surplus. Get busy and don't waste. You can dispose of this by-product locally and at good prices—a little "pep" and energy is all that is needed. The writer recalls several years ago of placing a 1-in. advertisement in a farm journal of wide circulation, and as a result shipped tar to nearly every Western State. In fact, shipped it to towns having gas plants, and we are still getting repeated orders from some of them.

In actual manufacture no set and fast rules can be laid down as to running conditions. No two sets can be operated alike, but with a good pyrometer and careful regulation of oil used your gas will be of constant quality and no waste of either material. To give service your gas must not vary from a constant standard. A good calorimeter used once or twice a day will correct and cut down offtimes unnecessary manufacturing and complaint expense.

Importance of having pressure gauges on every appliance is another point, in case of trouble, back pressure, especially, the trouble can be found at once and remedied. You should know what your normal pressure is on every appliance; it is surprising how much a few tenths pressure higher than normal makes in the yield of gas produced from your water gas set.

Home-Made Purifier

We have, due to favorable local conditions, a constant source of supply of iron borings and shavings, and we make a considerable saving each year by manufacturing our own oxide for purification. Once the raw materials are mixed, your gas maker can usually find time to take care of it.

I believe that many small towns are now purchasing purifying materials when really they should be making their own. Look up the resources of your town and see what you can find, then try a sample batch, keep

account of cost and see if it does not pay you.

Its the little things that lose the pennies which turn into dollars in the course of time.

Its the small leak of steam around a packing box on a valve or steam gland on a piston, a small gas leak in the piping from the machine or a leaky cap, these are small affairs, really not worth while to bother about, but just think what the total amounts to at the end of the month.

Don't waste, watch for the small leaks, the large ones will take care of themselves.

And in conclusion, remember a few dollars spent in labor and paint on your appliances each year will add many years to their life. This is especially true to your outside appliances, holders, oil tanks and buildings. Also keep up both the inside and outside of your plant; a little grass and a few shrubs outside instead of heaps of clinkers and litter, etc., usually found around the average plant, and a clean, well-kept interior is well worth while. It will pay for itself many times. It's good advertising, silent but effective, when the engineer comes to make a valuation.

The Cost of a Defective Water Cooler

In the composing room of a certain large Oklahoma City newspaper is—or, rather, was—a water cooler. At one time it had been a perfectly good piece of furniture; one could step up to it, press the little nickel valve release on top of the spout, and obtain in a fraction of a minute a cup full of sparkling water, iced to the proper temperature.

But as time wore on—so did the water cooler. The valve within the spout became disordered and the time required to draw a cup of water became greater and greater. Then one night the foreman of the composing room became exasperated because of the long wait before he obtained sufficient water to quench his thirst. He spent the greater part of the night watching the cooler and the men who went to it for drinks. Then he obtained a piece of paper and did some figuring. He first put down upon the paper the figure 40—representing the number of men employed. Next he multiplied 40 by 4—representing the average number of trips each man made to the water cooler during the night. The total was 160. Then he multiplied 160 by 4 again, obtaining 640. The four represented the average number of minutes spent by each man in obtaining a drink and getting back to work again.

Now wages in that composing room average about $5 for eight hours of work—about 60 cents per hour, or 1 cent every sixty seconds. The foreman figured that each man could obtain a drink of water in half the time then required if the spout were repaired. Very well, 640 minutes spent in getting drinks meant that the owners of the newspaper were losing 1 cent for every minute, or $6.40 per night. By repairing the cooler, that figure would be cut in half—each night—saving $22.40 per week and $1,140.40 per year. Having obtained this figure, the foreman presented the results of his work to the owners—and the water cooler was repaired forthwith.

The moral of this incident is merely this: In every establishment, however large or small, there are perhaps scores of just such leaks as was costing the newspaper owners more than $1,000 per year. They may not be apparent to the casual eye—but they are *there*. The successful business man is the man who looks for trivial leaks—and repairs them in time.—

Publications

Storage of Bituminous Coal

Circular No. 6 of the Engineering Experiment Station, University of Illinois. Author, H. H. Stoek, professor of mining engineering. Flexible board backs; 200 pages; illustrated. Obtainable from the Engineering Experiment Station, University of Illinois, Urbana. Price 40 cents.

The more general storage of coal during the spring and summer months is coming to be recognized as the only practical means of avoiding a coal shortage during the winter. Many corporations and individuals this year undertake, for the first time, to store large quantities of coal.

The storage of bituminous coal presents certain difficulties because of its tendency toward spontaneous combustion, with its attendant dangers and losses. The methods to be employed in avoiding spontaneous combustion have not generally been well understood, and those which have seemed successful in some cases have failed in others.

The Engineering Experiment Station of the University of Illinois has just completed a study of the problems involved in coal storage and has published the results in this volume. The reasons and advantages of storing coal are given, the kinds and sizes of coal which may be safely stored are described, and the many factors entering into successful storage are discussed.

Bibliography of Petroleum and Allied Substances 1915

Bulletin 149 of the U. S. Bureau of Mines; Van H. Manning, director. Author, E. H. Burroughs. Flexible board backs; 9 x 6 in.; 145 pages. Published by U. S. Bureau of Mines, Washington, D. C., from which one copy may be obtained upon request.

Persons interested in the study of petroleum and allied substances have long felt the need of a bibliographic index to the literature. This bibliography, which is intended to be the first of a yearly series, has been compiled by the petroleum division of the Bureau of Mines with a view to satisfying this need. The references include only the more noteworthy writings that appeared during the year 1915 in both the United States and foreign countries. Only patents plainly applicable to the industries in point have been included, although, of course, a close scrutiny of the great volume of patent literature might reveal many other patents of possible value. The references are arranged according to the subject classification on pages 3 to 11. This classification, which is to be followed in the succeeding bibliographies of this series, is offered as a guide for further study and classification of the pertinent literature.

Even for the Company Serving Small Cities Located in Inland Agricultural Districts the Possibilities for Industrial Fuel Business Are Not Inconsiderable

A Symposium of Industrial Gas Installations Which Bears Out This Contention—Classes of Prospects the Industrial Gas Man in Such Localities Meets With

A new idea was featured at the recent annual convention of the Iowa District Gas Association. This was a symposium of industrial gas installations. Various members cited installations they had made and tasks they had found to be industrial gas prospects.

The value of such contributions cannot be set too high. The average gas man is not in need so much of being sold the idea of the boundless opportunity that lies in the industrial branch as he is of cold facts which will enable him to get a clear conception of the kinds of tasks that offer a market for gas. He wants to know what is an industrial gas prospect. When he gets his basic facts in mind he will be ready to do creative work—to originate new industrial uses for gas. But first he must imitate, in order that he may later originate. Hence such contributions as were made to this symposium are invaluable to many. The following are selected from those offered at the convention.

With a Limit of 2½ Cents Per Gallon for Gas Cost, Burlington Company Gets Water Distilling Installation

By E. D. Clary
Secretary-Superintendent, Burlington Gas Light Company, Burlington, Iowa

One of Burlington's wholesale drug houses uses a 5-hp. gas-fired Kane boiler in connection with a No. 1 Polar water still for obtaining chemically pure water.

At the time these people were approached on this subject, we were informed that they were procuring their distilled water at a very low cost from a neighboring city. This arrangement was not entirely satisfactory, inasmuch as the water was not always chemically pure, and complaints from their customers were numerous. The demand for distilled water was steadily increasing, though no sales effort was being expended along this line.

Our customer, after giving the same careful thought and consideration, decided that a much larger volume of business could be obtained without increasing his selling cost. In order to maintain their reputation for selling products of quality, it was thought necessary to install their own distilling apparatus. For a starter, several makes of small gas-fired stills of 1 and 2 gal. capacity per hour were tried and tested, with the ultimate view in mind of installing a battery of small units to take care of their needs. This, however, was not satisfactory, and they were finally discarded. The manager then informed us that he would not consider any equipment unless he was assured the cost for gas would not exceed 2½ cents per gallon of distilled water.

After considerable correspondence with the Polar company, we were successful in obtaining their guarantee on the cost per gallon, and with this we were able to close the sale for a 5-hp. Kane automatic gas boiler with a Crane direct return steam trap, to be used in connection with a No. 1 Polar water still, which has a rated capacity of 10 gal. per hour. Actual tests show it to have a capacity of 14 to 15 gal. per hour.

The boiler and still are installed on the third floor in the chemical laboratory, and the Crane return trap is placed on the fourth floor, directly above the still.

The apparatus requires no attention after steam has been raised to 50 lb. The steam lines and the city water lines are then opened and the distillate starts running.

Upon leaving the still, the distilled water is immediately bottled in 5-gal. demijohns, connected to syphon one from the other. The overflow water is connected to a drain with faucets at intervals for procuring hot water for washing bottles, etc.; heretofore this hot water was heated on a hot plate as needed during the summer months.

Our customer is very well pleased with the cost per gallon and the operation of the equipment. It is another case of "gas can deliver the goods." The average of a series of tests covering 44.1 hours is given below:

Gas consumed, 15,100 cu. ft.
Water consumed, 966 gal.
Distillate collected, 585 gal.
Cost per gallon, $0.0258.

Desire to Improve Product on Part of Tire Pump Manufacturer Makes a Customer for Hastings, Neb., Company

By A. W. Borden
Manager, Hastings Light & Heat Company, Hastings, Neb.

Small cities located in inland agricultural districts do not, of course, afford the same opportunities for sales of gas for industrial purposes as do those towns which, by virtue of location, have become the established points for most classes of manufacturing. There are, however, frequent instances of exception to this, and I will briefly describe such an installation which it has been our good fortune to secure.

There is in Hastings a hand tire-pump factory which is at the present time turning out about 2,000 hand

pumps and auto grease guns per day. Up to quite recently they had been finishing the barrels of these machines by cold lacquering, but were finally prevailed upon to improve their product by the substitution of a high enamel finish, and we succeeded in securing the installation, first of one oven and later a second.

These are simple, but specially built rectangular ovens of No. 10 iron and the dimensions are 5 ft. x 4 ft. x 3 ft. 6 in., with door at end. Each oven will accommodate 480 pumps, which are suspended perpendicularly from a traveling rack or cage. The pump barrels are dipped in the enameling liquid by hand, hung upon the rack and, by means of a trolley, moved into the oven.

The oven is equipped with four 15 cu. ft. per hour Bunsen burners of an efficient type, which burn into 2-in. heat-distributing pipes, amply perforated, spaced equally of the length, and extending fully across the oven about 2 in. from the bottom of same.

The oven is previously brought to a temperature of 400 deg. Fahr., and the process of baking requires three hours.

The cost of fuel per article enameled is about one-sixth of a cent with gas at $1.35 per 1,000 cu. ft.

When turned out these goods possess a very high finish, and, both as to sightliness and durability, are much superior to those formerly produced, resulting in a pleased customer and a very respectable addition to the gas company's revenue.

Refusal to Be Deterred by Difficulties Enables Sioux Falls Company to Raise One Consumer's Bill From Ten Dollars to Two Hundred and Six Dollars Per Month

By Allan S. Graham
Superintendent, Sioux Falls Gas Company, Sioux Falls, S. D.

The special installation of gas appliances I will describe is that in the Carpenter Hotel, of Sioux Falls. This is one of the most recent and largest of our consumers, and one of the hardest to obtain. The installation is not exactly an industrial one, but the volume of the gas consumption puts it in the industrial class. The hotel is seven years old, and for the first four years after it was built did not pay. Eventually it failed, and a receiver was appointed and continued in control of the place for a year. The hotel during that period was not a good prospect, as its bills were barely being met, and no money was available for any outlay in appliances due to bad management. At the beginning of 1916, however, the receivership ceased and new management took hold, and immediately put the hotel on a paying basis. We at once began to urge them to abandon their coal-fired appliances and install gas, and they apparently took kindly to the idea, but never got quite to the point of doing it, giving as their excuse they did not want to lose the value of the old appliances, which would have been scrapped, and invest money in new gas appliances. The real reason was the ownership desired to sell out, and, of course, did not want to increase investment, but we did not know that until the sale was practically made. Fortunately the last purchaser bought the hotel to operate, and shortly after taking it over he was persuaded to try out gas as a cheaper and cleaner fuel. It was necessary to put in on trial such appliances as he could use, the necessary piping and appliances to be furnished at cost if gas proved satisfactory. The hotel had previously used about $10 worth of gas per month, principally for toasting and occasionally broiling.

Of the new appliances we first installed was a two-section hotel range, which was followed a little later with a broiler. These were entirely satisfactory. A few small appliances, such as hot plates and cake griddles were then added, and next we were asked by the hotel management to convert a large coal-fired bake oven to gas. This we started in to do with considerable grief at first, but eventually got the right kind of a burner, which gave excellent results and with very good satisfaction to the hotel management.

The hotel had considerable demand for short orders, and therefore established in a room adjoining a short-order room, or, as they call it, a "coffee house." For this they considered no other form of fuel except gas, and purchased and installed on their own initiative a large range with a combination baker and broiler, and with a large cooking surface. The result has been we have practically all of the fuel consumption in connection with the preparation of food. Where formerly the hotel was using only 10,000 cu. ft. of gas per month, the average for the past ten months, which is the period over which they have been using gas extensively, the consumption was 136,000 cu. ft. This has been an increase in revenue from an average of $10 per month to an average of $132 per month. Last month, in April, their bill was $206.

When we first began getting this business it was necessary to use much persuasion and to give the hotel every advantage for trying gas out to see what it would do. In connection with the installation of later appliances the high price of coal, of course, has been a help. While the gas rates are higher now than when we secured their first business by nearly 20 per cent, still we have every reason to think we will hold their business and they will continue as good consumers when conditions get onto a normal basis.

This is an especially good installation for us, as the appliances require little attention from us, the hotel having its own engineering department, and their volume of business will always be large because the hotel is the convention headquarters of the State of South Dakota.

Waterloo Company Increased Industrial Load 75 Per Cent in 1917 by Devoting Its Energies to Increasing Old Business Rather Than Digging into New Fields

By Arthur S. Butterworth
Superintendent, Citizens Gas & Electric Company, Waterloo, Iowa

In Waterloo, during 1916, we had fifteen consumers that we classed as "industrial," and these fifteen burned 22,500,000 cu. ft. of gas, which brought us an average return of 71 cents per thousand. In 1917 we had nineteen industrial consumers burning 39,335,000 cu. ft., which yielded us an average of 68 cents per thousand. In other words, we increased our industrial sales 75 per cent during 1917. As during the year we added but four industrial consumers, it is apparent we have devoted most of our energies to increasing old business rather than digging deeper

into the untouched field. This is, of course, in line with war-time operation.

At the present date very close to 10 per cent of our sendout goes to nineteen industrial consumers amounting to 100,000 ft. per day. From the present outlook we appear to be in a fair way to show a substantial increase in 1918 industrial sales over 1917. Our industrial consumers may be classed as:

7 Restaurants or hotels
2 Newspapers
1 Laundry
Y. M. C. A.
1 Hospital
7 Factories

With the exception of the seven factories, the industrial consumers offer very little out of the ordinary. Hence let us consider the factories.

Seven Manufacturing Concerns

Of these seven concerns, four manufacture gas engines, tractors or cream separators. Of the balance, two are foundries and one a meat-packing concern. The four gas-engine factories are our largest consumers, and use gas twenty-four hours a day. The bulk of our product is used in their carbonizing departments in pack hardening work, which embraces everything from the smallest cap screws to gear wheels 18 in. in diameter. Of course, there are smaller furnaces used in tool making and rivet heating.

The Waterloo Gasoline Engine Company is our largest consumer, and that part of their installation which is probably most unusual is their forging department. We are here supplying the necessary heat to furnish red-hot material for their bulldozers and triphammers. The large part of this consists in rod end work, which we are doing with furnaces of our own design and built by the gasoline engine works themselves—consists of nothing more than a furnace from 3 to 4 ft. long, 12 in. high and about 14 in. wide, open along one side, heat being supplied through blow burners with positive pressure air. The big advantage of gas over any other material for this work is the speed with which work can be turned out.

We installed, about a year ago, a large furnace identical with those used in the carbonizing department. In this furnace we heat bars about 4 ft. long and about 3 in. square to such a temperature that they can be put in the bulldozer and bent to a circle. These circles are afterwards welded and cut to gear wheels, and afterwards shrunk on smooth-faced wheels. The shrinking of these tires is done by gas in the carbonizing department with their regular furnaces.

A Unique Use for Gas

One unique use for gas was discovered by their shop foreman. They had, heretofore, large vats of muriatic acid in which halves of steel gasoline tanks were immersed to remove the surface oils prior to immersion in a lead bath. The cost of muriatic acid became excessive and the shop foreman conceived the idea of running the tanks through the carbonizing furnace and burning the oils out of them. This has worked very satisfactorily and is now done. After the surface oils are removed the tank halves are given a lead bath in a large vat holding about 10 tons of lead. This lead is kept in a suitable condition by a Premix burner and has been giving excellent satisfaction.

We are also lighting the entire plant with gas arcs.

The secret of successful industrial installation is, I firmly believe, "camping on the job" and doing your best to keep your equipment in constant operation through finding other uses for equipment already installed. Industrial gas is still in its infancy, and the day is surely coming when we gas men have got to get into the business on a 5 and 10 cent store basis. As electricity is the ultimate and economic basis of transmitting and utilizing power, just so surely will gas become the ultimate basis of supplying heat.

Universal House Heating

There will come a time—and I firmly believe it will be within the lifetime of you men here assembled—when the gas companies we represent will be called upon to heat every home within our cities. I do not doubt but what that may sound optimistic to a very high degree; but, gentlemen, I believe it, and sincerely.

The electric industry was born in 1879, and in thirty-nine short years we have seen its meteoric rise to its present state of near-perfection. The gas industry was founded in 1813, and for fifty years it was not thought practical to cook with gas, and even to-day the average gas man is skeptical when one suggests the heating of homes with gas. Suppose our electric friends had been content with the lighting business and had said, "Yes, an electric motor is very nice; but we must get 15 cents a kilowatt for our current and at that price we cannot compete with steam." Gentlemen, if it is profitable to generate current and sell it in quantities at a profit of a fraction of a cent, it is also profitable to sell gas in quantities at a very small profit. There is no more sense in building our distribution systems according to the best standards, and then subjecting them to a pressure no greater than the breath of a new-born infant, than there is in building across a ravine a foot bridge of 20-in. I-beams, 6 in. center to center. With a very small expenditure of money we could increase the capacity of our distribution systems close to 2,000 per cent without any danger, as certainly 2 pounds' pressure is nothing to cause a great deal of worry.

Bulk Carbonizing

If, then, our distribution systems can be made adequate, our chief difficulty comes in the manufacturing end. The answer to this is, I believe, bulk carbonization supplanted possibly by water gas to cover the cold weather peak. The time will come when every plant with an average load of 100,000 ft. per day and over will turn to bulk carbonization as a measure of economy, and maintain water gas equipment to take care of their variable peak.

The heating load in Iowa would be a six months' load, with possibly two additional months in severe years. The problem of idle equipment during the

(*Continued on page* 558)

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FIFTY-NINTH YEAR

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George B. Cortelyou

The selection of George B. Cortelyou as president of the new American Gas Association is both intelligent and reassuring.

He is the biggest National figure actively engaged in the gas industry at the present time. People who never heard of a National gas association, who never heard even of a gas industry, will sense that it must be a pretty big thing, since he is its head. And enhanced prestige for the gas industry is the big aim of the amalgamation of the American Gas Institute and the National Commercial Gas Association.

The selection is reassuring, in that Mr. Cortelyou is too big to be partial; too big, in fact, to even warrant a suspicion of partiality, whatever appearances may be. Insofar as he, as president, can control it, we are assured that the American Gas Association will be just as much the New Hartford—the smallest tfiat occurs immediately in mind—company's association as it will the New York Consolidated—the biggest—company's association.

Incidentally we are reminded that Mr. Cortelyou is the president of the latter company. It is a happy augury for the new association that its first head should also be the head of a company that has come through the trying problems of the past year without one smudge on its banners, one deficiency in the enthusiastic and willing discharge of every task of patriotism and public service, no matter how difficult, that has been offered it in a year that may well become historic.

The Trend Towards Extensions

It may be news to many that despite high costs of labor and materials, builders of gas-making equipment are busier than they have been in years. Despite the little we hear of construction activities, gas companies who place a high value on the goodwill they have gained in the past and who consider the future more than they value the present hard-to-obtain dollar are extending their plants.

It might not seem sound economics to spend two dollars to-day for something one might obtain for a dollar a few years hence, but it is necessary nevertheless.

The war ins't going to end to-day or to-morrow. Rather it seems to be shaped up for a fairly long, drawn-out affair. The sentiment of the country and that of the Allies is quite evidently for a war to an unconditional surrender. Nothing else will suffice. The enemy has revealed himself as too much of a mad dog to be given any leeway for mischief whatever. And wars to an unconditonal surrender are not won in a day. A nation has to be pretty thoroughly licked not to be able to at least drag things along.

Nor is it likely that even after the war there will be much of a let down in construction costs for many years to come. And in the meantime the demand for

gas is growing and will grow at an accelerated rate. No inconsiderable factor in the increased demand is the growing realization on the part of the public of the wastefulness of burning coal raw, thus wasting the most valuable constituents it contains.

The gas plant that was adequate a year ago will not be adequate two years from now—might not be next winter unless it is enlarged. And an impatient public, a public that has lately acquired a great, though in the larger proportion, erroneous confidence in its ability to handle its own big affairs will not long tolerate a gas company that cannot give it the service it needs.

Gas companies which are finding their plants inadequate to meet the demand must face the disagreeable alternative. Their earnings might not be what they ought to be, and it might be difficult and expensive to obtain capital, but the extensions must be made. It's a disagreeable plunge, but it must be taken. There is no greater crime in the public utility field than failure to render adequate service.

Tardiness in Inducting Women Into the Industries

Press reports inform us that the industries are attracting and employing women at a slower rate than was expected. This is unfortunate, and may result in expensive setbacks.

We know that almost a million men will have been taken from civil life in the first six months of 1918 by the selective draft. If the rate of call is maintained three millions will have been taken by the end of the year. Add these to the million or more in the service at the end of 1917 and consider the hundreds of thousands enlisted in the Navy and Marines. A very considerable total is revealed even for a country so large as this.

A very considerable proportion of these men must be replaced somehow. Immigration will not do it. The only resource is women.

Patriotic motives will attract a certain number of women who, from economic considerations, would not feel the need of doing such work. But attractive inducements in the way of compensation should be added, and it should be made known that welfare work in their behalf will be limited only at the point where further effort can bring no practical return.

We in the gas industry, especially, must realize that the termination of the war will not automatically return us to the situation as to employees that existed before. We had men discharging tasks that upon their return they will disdain. They are not, or never were, men's jobs.

The work we are doing now and will do in the coming months in substituting women should be looked upon as permanent work. With very few exceptions, the need is not one that will pass.

Assisting Certain Gas Companies to Maintain Good Service and Minimize Additional Burden to Consumer

In some situations, not a large proportion by any means, but a sufficient number to make the matter worthy of consideration, there exists an opportunity to assist the current financing of operations without largely adding to the burden of the consumer. These situations are those where a company having coal gas equipment available, but not sufficient coal, could, by reducing the proportions of carburetted water gas and increasing the coal gas output, put its gas into the holder at a materially lower cost than it is now doing.

The Federal Treasury Department is interested in the financial welfare of the community. There may be in the situation cited an opportunity for team work between it and the Fuel Administration.

The AMERICAN GAS ENGINEERING JOURNAL is aware that the latter body has not reached the point yet where it can find the coal it should and would like to allot. It may be that it could not see to it that these companies could get the raw material to increase their coal gas output. It would do no harm, however, for such companies to make their situations known, and it might do some good.

At the present time either the consumers are being called upon to make up a deficit that is greater than actually necessary or the companies are pocketing a loss that is in part avoidable.

Revived Interest in Industrial Business

Indications are outcropping of revived interest in industrial fuel business. Many companies which had stopped short altogether in this branch of the business have come back into the fold and are actively seeking new installations.

Industrial fuel is essentially a quantity demand, and few gas companies were so sure of their materials supplies that they did not hesitate at assuming new obligations. Also manufacturing and distribution facilities fell far short of the generally unprecedented demand.

But many, despite high costs, are enlarging their capacities. The coal supply still is troublesome, but the managements that are venturing into the industrial field again must have had confidence that even this holdback bids fair to be routed at least in part.

The revival of interest in industrial fuel is interesting, mainly as an indication that the period of readjustment to new conditions in the gas industry is passing. It no longer is wavering uncertainly as to what its next step would be, but is going forward again with firm, confident step, in the proper discharge of its obvious functions.

The times are not less troublesome or its problems less perplexing, but the gas man has taken his soundings.

He has determined more or less where he stands and what he is to expect, and he has been remarkably quick in doing so.

It is not perplexing problems that upset industries or people. It is uncertainties and lack of a basis upon which to found calculations. The gas man's problems have been by no means dissipated. They have become more numerous. But he has learned what they are and is now steadfastly at work overcoming them.

The American Gas Association An Actuality

The new American Gas Association is an actuality. An enthusiastic gathering of gas men assembled this week in New York City and started off under more auspicious conditions perhaps than any gas association has ever started off under before.

The caliber of men elected to the principal offices is an assurance that there will be no falling short from the high ideal the association has set for itself that human effort or intelligence can avert. The action of the Committee on Amalgamation in changing the status of active members, as suggested in various editorials in the AMERICAN GAS ENGINEERING JOURNAL—and incidentally in no other gas publication—from that originally outlined, previous to offering the by-laws and constitution to vote, removes any improper restraint from independent expression that would have been existent under the original plan.

It has been the AMERICAN GAS ENGINEERING JOURNAL'S contention that with an independent and enthusiastic membership it did not matter much what defects might be permitted to remain in the plan. It is the membership, in the final analysis, that counts most. The new association starts with a membership of the right kind. It is safe therefore to predict for it a brilliant success. Any weaknesses that may reveal themselves will be ironed out and remedied with the passage of time.

Tendency To-Day, in Boiler Firing With Natural Gas is Towards High Boiler Settings and Large Furnaces

In many ways gas is a most attractive fuel for use under boilers. It requires no stoking and no cleaning of fires. A number of boilers may be attended and a constant load maintained independent of manual labor. In Oklahoma, as in all natural gas fields, when first opened up it has been ridiculously cheap as compared with other forms of fuel, and not a great deal of attention was at first paid to economy in its use and the possibilities of the fuel were not realized. It is an acknowledged fact that a large percentage of this most valuable asset to our State has been wasted, and it is only in the last few years that we are beginning to take notice of the passing of this product of nature. Even now many of us are facing conditions that will make the subject of gas-fired boilers of no great interest to us except as a fond memory of what might have been, declared L. A. White, superintendent, Muskogee Gas & Electric Company, in a paper presented at the annual convention of the Oklahoma Gas, Electric and Street Railway Association.

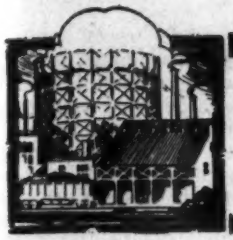
During the winter of 1917-18 the chief difficulty has been in obtaining the gas to burn, but with this accomplished the proposition resolves itself into one of obtaining complete combustion with a minimum of excess air.

Failure in this results in waste of fuel and, when boilers are forced, damage to the sheets or tubes. The factors which govern combustion are time, space and complete mixture of oxygen with the gas. This should be accomplished by putting the gas and air in violent agitation before entering the combustion chamber, but due to the impossibility of reaching each atom of carbon with its share of oxygen when only the proper proportions are present it is necessary to supply an excess quantity of air.

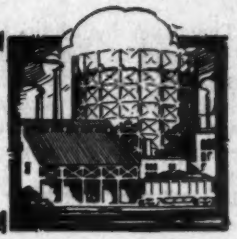
The ignition temperature of Marsh gas being 1233 deg. Fahr., combustion must be completed before the gases come in contact with the comparatively cool boiler tubes; therefore the necessity of a large combustion chamber. It is not many years since we seemed to think it necessary to burn our fuel as near the tubes as possible, as though the heat might vanish if given time. The tendency of the present day, however, is towards high boiler seatings and large furnaces, and when we construct our furnaces so as to prevent the flame from impinging on the tubes we will be able to drive the boilers 200 per cent of rating without difficulty.

Most of the boilers at Muskogee were originally coal-fired, and when gas burners were installed the grates were covered with fire brick, the burners placed in the furnace door and the flame directed against a checker work about 30 inches from the end of the burner. This arrangement proved to be satisfactory as long as the boilers were not driven hard, but as the demands on the boilers increased the grates were removed and ash pit lined with fire brick, and finally most of the burners placed in the ash pit doors, doubling the size of the combustion chamber and enhancing the capacity of the boilers. The theory of the checker wall was to assist combustion by presenting an incandescent surface to the gases, thereby insuring ignition and directing the hot gases at right angles against the heating surface of the boiler, the effectiveness of a square foot of heating surface being about eight times that of a similar area parallel to the gas flow, but the factor of time is left out of this speculation and what actually occurs is that the course of the gases is diverted and directed against the tubes, where the gas is cooled below the temperature of ignition and combustion arrested.

In operating a group of boilers without steam flow meters it is quite possible to drive one or more of the boilers beyond safe limits unawares, due to the condition of the burners either in lagging or leading boilers. It is well known that the orifice of the burner sometimes becomes obstructed, thereby diminishing the flow of gas and necessitating cleaning. If this condition is not general the load will naturally shift to the other boilers and a high gas pressure will be carried to offset the delinquency. If the burner orifice is adjustable, it is likely to be thrown out of adjustment in the cleaning and result in overfiring.



NEWS OF THE GAS INDUSTRY



With Status of Active Members Changed from that Originally Contemplated, New American Gas Association is Enthusiastically Launched in New York City

Election of George B. Cortelyou as President Proves Extremely Popular—No Changes in Original Plan of the Amalgamation Committee Other Than Those Made By the Committee Itself Previous to Offering the Constitution and By-Laws to Vote

One great National Gas Association instead of two of lesser influence is no longer a dream. It became an actuality with the launching of the new American Gas Association in New York City, June 6.

The day's proceedings were started by E. N. Wrightington, who called for the appointment of a temporary chairman and secretary. Charles M. Cohn and Carl H. Graf were called to the respective tasks.

Mr. Cohn recommended the acceptance of the plan outlined by the Amalgamation Committee in its entirety. J. B. Klumpp read the report of the committee and announced that it had changed the status of active membership from that of being dependent upon annual invitation for continuance to permanence. This is in line with suggestions advanced in various editorials in the AMERICAN GAS ENGINEERING JOURNAL since the plan was first made public. The only other change was as to the dues of members enrolled in all sections. Aside from these changes the plan of the committee was adopted in its entirety, there being no dissenting voice.

The nomination of George B. Cortelyou as the new association's first president gave rise to unusually prolonged applause. How much of the enthusiasm was due to Mr. Cortelyou's personal popularity and what part to acknowledgment of the obvious intelligence of the nominating committee's selection would be difficult to determine. The nomination of C. L. Holman as vice-president and W. H. Barthold as treasurer evoked little less enthusiasm. The directors nominated were N. F. Brady, John A. Britton, M. B. Daly, J. S. de Hart, Jr., E. S. Dickey, E. L. Hall, Arthur Hewitt, J. L. Richards, F. A. Bertram, Samuel Insull, H. D. Schall, S. T. Bodine, Henry L. Doherty, Emerson McMillin, Sidney Mason and T. N. McCarter. All those nominated for the respective offices were unanimously elected.

It was announced by Mr. Cohn previous to vacating the chair that the first convention of the new association would be held probably in November. At the time of amalgamation 218 gas company members were enrolled in the new association, six holding companies, sixty-six manufacturers and 936 individuals. Mr. Cohn brought the gas company membership up to 219 by immediately entering the Baltimore company.

Mr. Cortelyou in his address of acceptance of the office of president pledged himself to discharge the responsibilities of the office to the best of his ability and to seek diligently to help the association to attain the ideals set forth in the prospectus of the Amalgamation Committee. He consecrated the gas industry, without thought of self, to support the Government and the soldiers and sailors fighting its battles to the very limit of its powers and opportunities. The applause that greeted this part of his address was convincing that Mr. Cortelyou would not lack the aid of any part of the industry in carrying out the program he laid down.

The move to adopt the constitution and by-laws prepared by the Amalgamation Committee "until otherwise ordered" was made by Albert M. Barnes. The move to amalgamate was made by Arthur Hewitt. E. N. Wrightington moved the acceptance of the assets and liabilities of the existing associations by the new association.

The program for the morning having been carried out, the meeting was adjourned until two-thirty in the afternoon.

An interesting part of the afternoon's session was the opportunity presented to the gas men present to discuss with a representative of the National Oil Administrator the fuel oil situation. The prospect laid down was not altogether encouraging, though the gas companies were assured priority, first those recovering toluol, then those merely making gas. Mr. Wrightington asked the speaker to recommend that industries using fuel oil utilize gas instead. Mr. Sheffield did not at first catch the meaning of the request, and expressed the view that gas companies should not be aggressive in seeking new business. Upon Mr. Wrightington's citing an instance to make his request more clear, Mr. Sheffield expressed the view that, if following such a course there would be an ultimate saving in oil, it should be followed. Possibly because he was discussing oil no one asked him if it could be demonstrated that there would likewise be an ultimate saving in coal by citizens using gas instead of coal for cooking and heating he would not be inclined to modify his expression as to the seeking of new business on the part of gas companies.

The paper by Philip H. Gadsden on the financial problems of the utilities proved of great interest to the assemblage. The whole war program, Mr. Gadsden brought out, is predicated on maximum and increased service upon the part of public utilities. Sixty per cent of the effective industrial power of the country is dependent upon the public utilities. Gas plants and distribution systems are woefully inadequate and must be increased.

Mr. Gartley's paper on the relation of the gas industry to the military necessities of the Nation was a revelation, and very encouraging to those who might have become pessimistic as to the ability of the American people to accomplish things. Mr. Gartley brought out the interesting point that, when the Oil Administration first contemplated suggesting to State and local authorities the lowering of B.t.u. requirements, generally to the Massachusetts standard, 528 B.t.u., as a means of saving oil, prominent and representative gas engineers were called into consultation on the matter. *These men set it down definitely as their judgment and belief that with a maximum requirement of 528 B.t.u., there would be no complaints on the part of consumers, and no increase in registered consumptions of gas for equivalent amount of work done;* in other words, that the B.t.u. in excess of that amount is in the consumers' hands merely a waste, a waste that, by the way, requires oil to provide for at a time when many companies, for lack of oil, face for the first time in their history the possibility of perhaps having to say to their freezing and hungry consumers, "We can give you no gas, because there is no gas to give."

One almost wished that among those who listened to Mr. Gartley's statement there might be some of the public service commissioners or other authorities, who have manifested in the past year or so, so great a jealousy about maintaining B.t.u. standards much above this figure. We do not believe even these people would have believed for a moment that the gas engineers who expressed this opinion deliberately misled an officer of their Nation at a time when the sons of some of them, at least, are venturing their lives in the Nation's service, nor do we believe they would have thought for a moment that these prominent gas engineers have not learned anything as to the practical utilization of gas in their long years of experience. The only other alternative would be to set down their opinion as correct.

At the dinner in the evening, in addition to the speakers listed on the program, George B. Cortelyou made a brief address and A. C. Bedford, president of the Standard Oil Company, spoke on oil supplies. He felt that there would be oil enough for the gas companies, but urged them to conserve. The real difficulties are not of supplies, but of transportation. He urged all companies which have not oil storage capacity sufficient for a sixty days' supply to provide such without delay.

Fayette County Company Must Refund Meter Deposits

Ten-dollar deposits as required by the Fayette County Gas Company, Uniontown, Pa., were declared unjust by the public service commission. So important was the matter considered that a conference was held with the public utilities committee.

Among the excerpts of the opinion are:

"A deposit rule so general in terms as the respondents: 'Each applicant for service who is not financially responsible will be required to deposit with the company, etc., is too indefinite. It fails to define the factors by which the financial responsibility shall be determined or the test which it is proposed to apply, and therefore furnishes opportunity for unjust discrimination and friendly or unfriendly application of its terms."

The opinion adds: "To take as respondents did, under the rule which we have struck down twice the average monthly payment of all its consumers, whereby a sum of $10 was obtained, and exact that amount from all whose credit had not been established to the satisfaction of the respondent, is neither reasonable nor just. The average so made up of large consumers as well as smaller ones is fair to neither."

The commission gives the following as the test that may ordinarily be applied to determine responsibility: "Ownership of premises, guarantee of payment, and prompt payment of bills for a period, say, of two years."

The commission holds further that "in case of delinquency a utility company should apply such portion of a patron's deposit as is necessary to liquidate the bill, and it may at the same time require that the deposit be restored to the original amount. If the deposit is not restored by the time it has become completely absorbed, service may be discontinued, provided that reasonable notice of an adopted and filed rule of its intention so to do has been given. A utility company cannot discontinue service so long as it still has in its possession a portion of the customer's deposit."

Commission Grants Increase for Decatur

Rate increases which the Decatur (Ill.) Railway & Light Company will be permitted to put into effect by decision of the Illinois Utilities Commission are as follows:

Gas increased from 95 cents per 1,000 cu. ft. for the first 5,000 cu. ft. to $1.05 per 1,000 net. Gross rate, from which discount is figured, will be $1.10.

LeMars Company Seeks Increased Rate

That the rapidly increasing cost of production is causing such a deficit that the LeMars (Iowa) Gas Company is unable to longer furnish its customers with gas at the present rate of $1.35 net per 1,000 ft. was stated by Manager O. H. Hinds at a special meeting of the city council, which was called at his request. He says that it will be necessary to raise the rate 27 cents more per 1,000 ft. to pay the expenses of the company and allow for depreciation on the plant.

Ocean County Readiness-to-Serve Charge Approved

The board of public utility commissioners recently approved the application of the Ocean County Gas Company to put into effect a readiness-to-serve charge of 25 cents a month or $3 a year to be added to the rate now charged by the company. The rate for gas consumed will be $1.35 gross per 1,000 cu. ft., less 10 cents per 1,000 cu. ft. for prompt payment in ten days after rendering bill, instead of $1.50 per 1,000 cu. ft., less 10 per cent discount for prompt payment as at present, when this service charge goes into effect, which is June 1, 1918.

George B. Cortelyou Elected President of the New American Gas Association

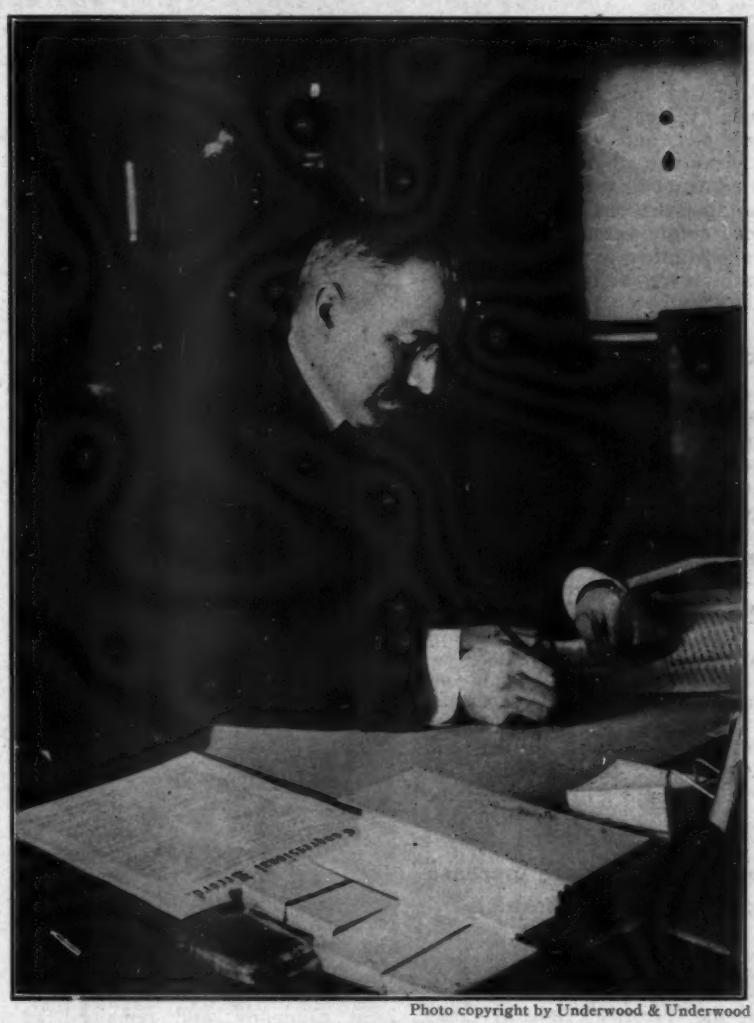
Former Secretary of the Treasury of the United States, the First Head of the Association Into Which Are Incorporated The American Gas Institute and The National Commercial Gas Association—Now President of the Consolidated Gas Company of New York —The National Figure During the Administration of President Roosevelt

On June 6 George B. Cortelyou was elected president of the American Gas Association.

Born in New York City July 26, 1862, he received the benefits of an excellent education. He attended the Hempstead Institute and the State Normal School of Westfield, Mass., and studied at the New England Conservatory of Music, Boston. He completed a course at the Wadsworth Stenographic Institute. For a year after graduation he served as an assistant in the school, then resigned to engage in business.

The career of Mr. Cortelyou, now president and trustee of the Consolidated Gas Company of New York, and director in twenty-one other corporations, has been one of meteoric progress. Without any particular political training, he rose from an unimportant position in the White House to be the first Secretary of Commerce and Labor, chairman of the National Committee of the Republican party—a position supposed to require the ripest and shrewdest of political tacticians, Postmaster General, and, finally, Secretary of the Treasury under Roosevelt.

Stenography was the stepping stone that he used to attain higher positions. It gave him the necessary equipment to act as private secretary to prominent men, and this with other qualifications carried him to the White House and kept him there under three Presidents.



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GEORGE B. CORTELYOU

Domestic Needs Have Priority —Industries Warned of Gas Shortage

Domestic consumers of gas in Ohio will get it next winter, even if industries have to have their supply curtailed, according to an order received by the East Ohio Gas Company from the State public utilities commission, which has just sent a similar order to every gas company in the State. If necessary, the supply must be cut off from industries to meet the needs of individual consumers. After the consumers are cared for, the interests of food plants and munition factories must be attended. The order divides industries into classifications with priority of service provided in accordance with the importance of the industries. The order is issued at this time so that the companies can make proper preparations to meet the conditions imposed by the order.

Bondholders Buy Visalia Gas Company at Receiver's Sale

Receiver Susman Mitchell recently sold the Central California Gas Company, Visalia, Cal., to the bondholders, represented by John Jarbine and John Edmunson, of Los Angeles. The price was $345,000.

Power of Commission to Set Aside Franchise Contracts in Making Rates Upheld by Court

The Missouri Supreme Court on June 4 upheld the power of the public service commission to set aside franchise contracts irrespective of their reference to rates for public service. The opinion, written by Chief Justice Graves in the appeal of the City of Sedalia from the order of the commission upholding franchise contract with the Sedalia Water Company—decision unanimous, and affects gas utilities as well as others—said in part: "No contract as to rates will stand as against the order of the public service commission for reasonable rates, whether such reasonable rates be lower or higher than contract rates."

Macon Company Granted Increase

The State railroad commission recently granted the petition of the Macon (Ga.) Gas Light Company to fix a minimum service charge of $1 per month instead of the former charge of 25 cents on straight meters and 50 cents on slot meters.

Higher Rate Allowed for Charles City

The Charles City (Iowa) Gas Coompany has been granted permission to raise its rates. The old price was $1.55 per 1,000 ft., the new will be $180, with a discount of 20 per cent if paid before the tenth of the month.

Application for Rate Increase Filed by Waukesha Company

The Waukesha (Wis.) Gas & Electric Company has made application to the Wisconsin Railway Commission for the right to increase its rates, tolls and charges, setting forth the reason why it is necessary to its just interest to receive a greater income to meet its legitimate expenses and insure a reasonable return on its investment. The company in its petition asserts that it is now operating its Waukesha plant at a financial loss.

Pursuant to this application the railway commission has named Friday, June 7, at 10 a. m., as the time of hearing on this application at the office of the commission in Madison.

Elected President of Iowa District Gas Association

A. W. Borden, who was elected president of the Iowa District Gas Association for the ensuing year, was born at Canning, Nova Scotia, Canada, 1881.

After leaving common schools he attended Acacia Villa Academy at Hortonville, N. S. Later took a special course in mathematics at Mount Vernon, N. Y. Completed trustees' practical class in gas engineering, section 1904.

His early connection with the gas

A. W. BORDEN

business began at Mount Vernon, N. Y., with the Eastchester Gas Lighting Company (clerical), 1900-1903 with Galesburg (Ill.) Gas & Electric Light Company as chief clerk, and later as assistant works superintendent. Employed to rebuild plant of the Hastings (Neb.) Light & Heat Company, and remained as manager.

At present he is vice-president and general manager of the Hastings (Neb.) Gas Company and the Grand Island (Neb.) Gas Company.

He is a member of the American Gas Institute and National Commercial Gas Association—*now* of the amalgamated association—also of the Iowa District Gas Association. Past exalted ruler Hastings Lodge 159, B. P. O. E. and director Hastings Chamber of Commerce.

Central Indiana Company Files Application for Increase

The Central Indiana Gas Company, which operates gas plants at Muncie, Marion, Anderson, Elwood, Hartford City, Fairmount, Alexandria, Riverside City and Normal City, Ind., has filed a petition with the Public Service Commission of Indiana in which it says:

"Owing to the abnormal conditions which have been brought about by the war, the resultant increase in the use of natural gas and the consequent interruptions in service of natural gas, particularly at points distant from the producing source (which, in case of your petitioner, is the West Virginia fields), the enormous increase in the cost of labor and material entering into the production of artificial gas, and the increased cost of distribution from like causes, the rates of your petitioner now in force are insufficient to yield an adequate return upon the true value of the property belonging to the petitioner and used and useful in its business. Application is hereby accordingly made for authority to increase the rates of your petitioner."

It asks a new rate for natural gas, ranging from 70 cents per 1,000 cu. ft. net, for the first 1,000 ft, to 30 cents net for all over 5,100,000 cu. ft., and a schedule of rates for manufactured gas, ranging from 90 cents net for the first 1,000 ft. to 40 cents net for all over 100,000 cu. ft.

Newton and Watertown Consumers to Pay 10 Cents More for Gas

The board of gas and electric light commissioners has authorized the Boston Consolidated Gas Company to increase 10 cents per 1,000 ft. the price of gas it furnishes the Newton & Watertown Gas Light Company. The new price is 55 cents a thousand. The Newton & Watertown company is authorized to pay the Consolidated company $6,400 a year for the use of its pipes. War costs were the basis of the Consolidated company's requests for these authorizations.

The people of Newton and Watertown will have to pay during the war 95 cents per 1,000 ft. for gas instead of 85 cents, which has been the price the last three years. The gas and electric light commission authorized the advance.

Fifty Per Cent of Membership in Attendance at Thirteenth Annual Convention of Iowa District Gas Association

Public Utilities, One Time Luxuries, Are Now Necessities and Should Be Encouraged States G. W. Clabaugh, Who Takes Exception to Mayor's Proposal That Public Utilities Should Operate With Low Rate of Income During These Times— A. W. Borden Elected President—Co-operation in War Times—Results Obtained From Toluol Recovery Plant at Des Moines

The thirteenth annual convention of the Iowa District Gas Association, which includes the States of Iowa, Nebraska and South Dakota, was held on May 28 and 29, 1918, at Des Moines, Iowa. Convention headquarters were at the Chamberlain Hotel, the sessions being held in the spacious auditorium on the ninth floor. There were seventy-five men in attendance, which represents 50 per cent of the membership, a number of members, particularly small plant men, being prevented from attending due to the labor situation in this territory. This is primarily a farming district, and the farmers are offering $75 per month and board, so that many of the smaller towns are almost denuded of labor.

The convention was called to order by President G. I. Vincent, who came from his present location, the distant city of Syracuse, N. Y., to preside at this, possibly the last Iowa District Gas Association convention which he will attend as an active member. Hon. Thomas Fairweather, Mayor of Des Moines, welcomed the association in an address the keynote of which was that the public utilities should be willing to operate with a low rate of income during these times, and in this way help shoulder the burden of successfully prosecuting the war. In a most excellent and eloquent response G. W. Clabaugh, secretary of the Omaha Gas Company, took issue with the Mayor, claiming that public utility companies have the right to expect a fair return on their investment even in war-times, and where increased operating costs have made an increase in rates necessary the local authorities or State commissions should, after investigating and verifying the facts, grant such an increase. In other manufacturing and merchandising industries an increase in the cost of production is immediately taken care of by raising the selling price so that the margin of profit is not materially affected. Public utilities—

Re-elected Secretary-Treasurer Iowa District Gas Association

H. R. STERRETT

gas, electricty and street railways —which were once luxuries are now necessities, and should be encouraged by those who have the authority to regulate their operations. Mr. Clabaugh warned both Mayor Fairweather and the men attending the convention that unless the public utility companies of this country are treated in a fair and impartial manner by the various local authorities or State commissions that nothing but disastrous results would follow.

After the ordinary routine of convention business — reports of the council, committees, secretary-treasurer, etc.—the following officers for the ensuing year were nominated and unanimously elected: President, A. W. Borden, Hastings, Neb.; first vice-president, George D. Roper, Rockford, Ill.; second vice-president, W. H. Taylor, Omaha, Neb., and secretary-treasurer, H. R. Sterrett, Des Moines, Iowa. Members of Council: Charles Smith, Yankton Light & Heating Company, Yankton, S. D.; J. E. Harsh, Lincoln Gas & Electric Company, Lincoln, Neb.; C. N. Chubb, Peoples Light Company, Davenport, Iowa, and H. B. Maynard, Citizens Gas & Electric Company, Waterloo, Iowa.

President Vincent's address, while short, was to the point, and drew forth much favorable comment.

The following new members were elected to the association:

Honorary Members: H. C. Blackwell, general manager, Kansas City Electric Company, Kansas City, Mo.; G. I. Vincent, engineer, Syracuse Gas Lighting Company, Syracuse, N. Y.

Active Members: Arthur S. Butterworth, superintendent gas department, Citizens Gas & Electric Company, Waterloo, Iowa; G. C. Caywood, cadet engineer, Des Moines Gas Company, Des Moines, Iowa; Chester N. Chubb, general manager, Peoples Light Company, Davenport, Iowa; M. F. Goodbody, treasurer and general manager, Webster City Gas Company, Webster City, Iowa; A. S. Harrington, manager, Northern Iowa Gas & Electric Company, Eagle Grove, Iowa; T. J. Hanlon, president Peoples Gas & Electric Company, Mason City, Iowa; John A. Reed, owner, Perry Gas Works, Perry, Iowa; William J. Wuestenfeld,

general superintendent, Muscatine Lighting Company, Muscatine, Iowa.

Associate Members: W. S. Grear, district superintendent, Welsbach Street Lighting Company, Chicago, Ill.; R. W. Hoey, sales manager, Pittsburgh Water Heater Company, Kansas City, Mo.

The amalgamation of the American Gas Institute and the National Commercial Gas Association, to take place on June 6, was explained to the convention and the action approved of. Communications were read from George H. Waring, the only honorary member previous to this meeting, who is now general manager of the Utah Gas & Coke Company, Salt Lake City, Utah; L. L. Kellogg, president, Sioux City Gas & Electric Company, Sioux City, Iowa; Charles Smith, secretary and manager, Yankton Light & Heating Company, Yankton, S. D., and Col. E. G. Pratt, of Chicago, all expressing their sincere regret at not being in a position to attend the convention.

The Tuesday afternoon session was opened with a stirring patriotic address by Fred W. Sargent, attorney for the C. R. I. & P. Railway Company. His subject was "Co-operation in War-Times," and he showed how Germany is the exponent of "involuntary" co-operation and as such has accomplished great achievements thus far in the war, while the United States is the typical example of "voluntary" co-operation and has in the past year performed wonders. Mr. Sargent predicted that if the people of this great nation will only hold together and work for the one end, that "voluntary" co-operation will surely triumph and that when peace comes it will be an American peace. Mr. Sargent is an orator of no mean ability, and at the conclusion of his address the applause was spontaneous and sustained.

H. A. Johnson, of Omaha, read a very interesting paper on "Accident Hazards and Fire Protection in the Gas Industry." He covered the subject in a most thorough manner, and when this paper is printed it should be of great assistance to the men who are interested in taking precautions to prevent fire and reduce hazards at their plants, for it is not a theoretical treatise but is written from experience.

President Vincent read a statement issued by the directors of the War Finance Corporation on May 23, 1918, which appeared in the June 1 issue of the AMERICAN GAS ENGINEERING JOURNAL.

This resolution was discussed by H. B. Maynard, of Waterloo, Iowa, who said that in his opinion "it was a case of the doctor demanding his fee before treating the patient; and that while he hoped otherwise, he did not feel optimistic as to the results which the War Finance Corporation would accomplish if it follows this principle." T. J. Hanlon, of Mason City, Iowa, in his discussion was of the opinion that no utility company should expect to borrow money even from the Government unless the utility was in a solvent condition and could at least pay the interest. Mr. Hanlon thought that the War Finance Corporation had taken this means of bringing to the attention of local authorities and State commissions that where operating costs had increased abnormally, rates would have to be increased sufficiently to allow the utility companies to still show a reasonable return on their investment if the Government is expected to advance any money from the war funds to such utilities.

Although not included in the program, this discussion gradually became one of "rate increases" and was taken part in by men from practically every location in this district. Many have secured increased rates, others have applied and failed, while some are preparing to make application. The methods followed and plans to be used were discussed by men from each of the above classes with the idea that some other man might possibly be assisted in his case. It seemed to be the unanimous opinion that the small plant man who in normal times has a comparatively small net income cannot afford to start court proceedings in order to secure an increase in rate, because he would probably be in the "arms of a receiver," as Mr. Kidder, of Red Oak, Iowa, expressed it, before the court renders a decision. The association was of the unanimous opinion that in all rate questions — applications, investigations, etc.—the utility companies should be fair to the public, for the public is really a partner in so far that the utilities lay their pipes, conduits or tracks on the public property. The plan of "laying all the cards on the table" seemed to be advocated by all the men as being one of the best means of convincing the public that an increase in rates is necessary, and also that the leaders of the community should be shown, personally if possible, the facts in the case.

At the conclusion of this discussion H. C. Adams, of Des Moines, Iowa, read a paper entitled "Some Notes on the Toluol Recovery Plant at Des Moines," in which he briefly described the operation and construction of the Des Moines plant, together with some of the results obtained. The discussion of this paper took place at the Wednesday morning session, and among those who took part were W. J. Bertke, A. S. Butterworth, W. H. Taylor, E. D. Clary and H. R. Sterrett. President Vincent told of some of the Government war activities as he had seen them at Washington, D. C., and Mr. Adams closed the discussion.

In Mr. Rice's absence the secretary read his paper on "Manufacturing Results and How to Obtain Them," a most interesting contribution, the keynote of which was "save—don't waste; watch for the little leaks and losses and the big ones will take care of themselves." Mr. Rice gave several examples showing where the plant superintendent can reduce his costs. In discussing this paper Mr. Kidder, of Red Oak, Iowa, described a waste heat boiler which he has installed, utilizing the hot gases ordinarily lost while blowing. He made use of a horizontal return tubular boiler and made a connection from the top of superheater to the fire box. He expects to put in an electrically driven blast plant and build a new stack with increased draft, and then thinks his waste heat will be sufficient to supply all steam without using coal fires. Mr. Tenney, of Ames, Iowa, commented very favorably on the waste heat boiler installation for small plants. He also explained how exhaust steam was successfully utilized for gas-making purposes on some Tenney sets. A three-way valve is used so that if the exhaust steam is insufficient the deficiency may be made up with live steam. Mr. Tenney also stated that he has been experimenting for two years on the use of bituminous coal for gas making, and is now able to secure very

good results. Mr. Butterworth, of Waterloo, in this connection said that the East St. Louis plant is making gas in 8-ft. 6-in. sets with 100 per cent soft coal and obtaining very good results, but he added that it is necessary to obtain big, muddy coal from a certain mine on the Illinois Central Railway. This coal has a peculiar property of "holding up" under the intense heat. W. H. Taylor brought out the fact that gas has not been successfully made on 11-ft. 6-in. sets, and that the gas-making capacity is reduced on the 8-ft. 6-in. sets using bituminous coal.

This paper was followed by a symposium on "Special Industrial Installations," in which each man described an installation in his territory which he thought would prove of interest to the convention, telling how the business was obtained, why the particular installation was made, and what the results have been in gas consumption, satisfaction to the consumer, etc. Contributions to this symposium were made by A. W. Borden, A. S. Butterworth, E. D. Clary, A. S. Graham, C. S. Phillips, R. J. Ritchie, H. R. Stephenson, E. H. Martin and W. J. Bertke. Among the various installations described, those at the Omaha and Sioux City packing houses, where gas is utilized for singeing and branding hogs, for smoking hams and bacon, and for making meat-loaf, as well as for other miscellaneous purposes, were exceedingly interesting. E. H. Martin described a modern gas-fired crematory located in Des Moines, and arranged a cremation for those who wished to see the process. A large number of the delegates attended and became well informed at this method of disposing of the dead.

Mr. Vincent asked A. W. Borden, the newly elected president, to take the chair during the adjournment proceedings, which he did, calling on Mr. Clabaugh for an expression of the association's sentiments on the services rendered the association by Mr. Vincent. Mr. Clabaugh eloquently eulogized Mr. Vincent's many years of service as secretary and now as president, and finished his remarks by proposing Mr. Vincent for honorary membership, since he is now located in a distant city. This motion was carried unanimously by a rising vote. W. H. Taylor reported as chairman of the "final resolutions committee," commending everyone concerned in the preparation of this most successful Iowa District Gas Association convention. After singing "America," being led by John T. Parker, the convention adjourned. E. H. Martin, as chairman of the entertainment committee, arranged for theater and boxing match parties on Tuesday night, and Wednesday afternoon took the delegates in motor buses for an inspection of Camp Dodge, one of the National Army cantonments, situated about twelve miles from Des Moines.

Retiring President of Iowa District Gas Association

G. I. Vincent, of Syracuse, N. Y., the retiring president of the Iowa District Gas Association, was born in Philadelphia, Oct. 25, 1877. He was educated in the Philadelphia

G. I. VINCENT

public schools and high school, and graduated from the University of Pennsylvania in 1898, with the degree of B.S. in electrical engineering. Subsequently he took the degree of Mechanical Engineer from the same institution.

He entered the service of the United Gas Improvement Company, Philadelphia Gas Works, in 1899, and held various positions in the distribution department of the Philadelphia Gas Works until 1904. Was assistant superintendent of the Allentown Gas Company until March, 1905, when he accepted the position of engineer of the Des Moines Gas Company, where he remained until February, 1917, when he accepted the position of engineer of the Syracuse Lighting Company. Mr. Vincent has written a number of technical papers for the Iowa District Gas Association, and papers and committee reports for the American Gas Institute. He has been the chairman of two committees of the American Gas Institute and also a member of the technical committee. He was one of the vice-presidents of the International Gas Congress, of San Francisco. He is a member of the American Society of Mechanical Engineers, the American Gas Institute, the National Commercial Gas Association, the Iowa District Gas Association, the Empire State Gas and Electric Association, and the University Club, Technology Club and Onondago Golf and Country Club, of Syracuse. He is also a member of the Town Planning Committee of the Chamber of Commerce of Syracuse.

Asbestos Protected Metal Company Changes Its Name

Effective May 1, 1918, the name of the Asbestos Protected Metal Company, of Pittsburgh, Pa., will be the Aspromet Company. When this company was established, in 1905, its sole product was asbestos protected metal. Their initial product meeting with universal favor resulted in their complementing the same by adding to their line other building materials that were used and bought by the same people who use and buy asbestos protected metal. Now they have a very complete line of building material specialties, many of which contain neither asbestos nor metal in their make-up.

Thus, the descriptive name, Asbestos Protected Metal Company, which originally served them so well, became restrictive to the point of being misleading; hence the change.

Apollo Company Files Rate Increase Petition for Natural Gas

The Apollo (Pa.) Gas Company has filed with the public service commission notification of increased rates from 10 to 12 cents per 1,000 ft. on natural gas, effective June 1, to manufacturers in the Vandergrift and McKeesport fields.

Peoples Company Allowed Increased Rate

In an order entered by the public utilities commission, proposed gas rates of the People's Power Company affecting Rock Island, Moline, East Moline and Silvis, Ill., were made effective as of May 1, 1918. They are established for one year. The order vacated a suspension of the rates entered by the commission recently.

Under this ruling of the commission, gas will cost $1 net instead of 85 cents per 1,000 ft. Petition for the increase has been before the commission several months, and was recently suspended till November.

Societies and Associations

THE GAS RESEARCH SOCIETY, having for its object an examination into the constantly widening function of fuel gas in the industrial arts, was organized by representatives of numerous manufacturing interests, gas companies and gas appliance makers at a dinner held at the Sherman House in Chicago, May 21. Monthly meetings will be held at which papers on the workings of gas in various special purposes will be read. The results of personal experiences with fuel will be reported as well as all information concerning improvements bearing on the problems which develop. A committee was appointed to arrange the details of this union with instructions to report at the next meeting of the society, at which a chairman, vice-chairman and an executive committee of three will be elected and likewise a secretary. The committee is composed of F. F. Cauley, representing the makers of gas; G. F. Gebhart, professor of mechanical engineering at Armour Institute, Chicago, representative of the educational interests concerned, and C. J. Levey, engineer of the National Machine Works, representing appliance makers. H. H. Clark was made ex-officio secretary. Professor Gebhart's appointment to membership was made in recognition of the fact that the extension of gas fuel to new industrial uses creates many technical problems of which note must be taken in the training of gas engineers in institutions like Armour and the Illinois State University. It is intended that close contact shall be maintained between the committee and the authorities in both of these institutions and in others in the State where engineering is taught. There will be a continual reference back and forth of questions arising. There was no difference of opinion expressed at the meeting as to the need of the society. In the interchange of views developed in the animated discussion the greatest interest was expressed in the subject and its possibilities. One of the noteworthy talks was made by Professor Parr, of the Illinois State University. He predicted that the days of fuel oil supplies were practically numbered and that the vast increase in gasoline-driven propulsion machinery would show no lessening after the war. Professor Parr recommended the carbonizing of coal. Coke and gas were urged in its place as fuel.

THE COAST COUNTIES GAS & ELECTRIC COMPANY employees from Santa Cruz and Watsonville, Cal., met at the Hotel Appleton recently for a get-together dinner and conference. Following the dinner the subject taken up was "Dealing with the Consumer." O. A. Brugler acted as toastmaster and called for a number of short talks. S. Waldo Coleman, general superintendent, and Vernon Vissiere represented the San Francisco office, while District Manager R. L. Cardiff and G. L. Fitzgerald were over from Santa Cruz.

Fremont Company Announces Increase

Announcement of a raise of 25 cents per 1,000 ft. in the price of gas was made by the Fremont (Neb.) Gas, Electric Light & Power Company. Six weeks ago the company asked permission of the city council to make the increase. The council has had the matter under consideration, but no definite action has been taken.

A committee was appointed to investigate records of the gas company. About a year ago the council passed an ordinance providing for a cut of 15 cents per 1,000 ft., or from $1.50 to $1.35. The gas company went to the courts and the case is now pending in the United States court at Omaha. The new rate will be $2 per 1,000 ft., with a rebate of 25 cents if the bill is paid by the 10th of the month.

Rate Increase Allowed in Greensboro

By an order granted recently, the Southern Public Utilities Company, of Greensboro, N. C., is permitted to increase its gas rates from $1.35 gross, $1.25 net, per 1,000 cu. ft. to $1.60 gross and $1.50 net, in accordance with the petition filed with the corporation commission some time ago.

Hartford to Pay 10 Cents More for Gas

Beginning May 13 the Hartford (Conn.) City Gas Light Company will charge 10 cents more for 1,000 cu. ft. of gas, under 10,000. This will make the cost $1.20 for each 1,000 cu. ft. used, which, with the usual 10 cents per 1,000 cu. ft. discount, will make the price $1.10.

Personal Notes

JAMES H. READIO, JR., has resigned his position as assistant superintendent of the Pawtucket (R. I.) Gas Works and has accepted a position as assistant chemical engineer with the Providence Gas Company.

GEORGE B. WRIGHT, sixty years old, one of the oldest employees in point of service of the North Adams (Mass.) Gas Light Company, died recently in North Adams Hospital. He was born in Easthampton and was a member of the Elks and Foresters.

GEORGE WEHRLE has been appointed general manager of the Niagara Light, Heat & Power Company, of Tonawanda, N. Y., and will assume his new duties about June 15. The Tonawanda property is a subsidiary of Henry L. Doherty & Company.

H. E. MERRILL, of Toledo, Ohio, will succeed George Wehrle as superintendent of the gas department of the Denver (Col.) Gas & Electric Light Company.

JAMES POTTER has been appointed manager of the Amherst (Mass.) Gas Company, to succeed J. J. O'Connell, who has entered the United States Army. Mr. Potter has been in the service of the company for ten years.

W. W. FREEMAN, president of the Union Gas & Electric Company, recently returned to Cincinnati from Washington and stated that action in awarding contracts for the construction of the nitrate plant unit which is planned for Elizabethtown is expected to be taken in the very near future. He said that all details were now being worked out and that as soon as the contracts were let construction could be started immediately. Mr. Freeman returned to Washington May 22. His work there is in connection with the drawing up of the contract for this service.

H. H. CLARK, who in addition to his duties as industrial gas engineer of the Public Service Company of Northern Illinois, Chicago, has been supervising the gas distribution system, resigned May 15 as engineer of gas distribution.

E. H. ENANDER has been appointed engineer of gas distribution of the Public Service Company of Northern Illinois, to succeed H. H. Clark. Mr. Enander assumed his new duties May 15.

Pacific Gas & Electric Company Ask for Higher Rate

The Pacific Gas & Electric Company has asked the State railroad commission for authority to increase its gas rates in San Francisco, Cal., declaring that the present rates do not compensate the company because of the increased cost of operation due to the higher cost of oil and a raise in Federal taxes.

The company says it buys its crude oil for gas-making from the Associated Oil under a contract expiring in 1921 at the average field price, plus a cent and a half collection charge, plus a 10 per cent commission and a transportation charge of 25 cents a barrel. Recently, the company declares, the Associated Oil gave notice that oil would be increased 25 cents a barrel on June 1, which would bring the gas company's cost to $1.62 a barrel.

The company says that the railroad commission, in fixing rates to be charged in San Francisco, used $1.35 as the cost basis, and that the raise in oil will add 5.25 cents per 1,000 ft. of gas to the company's operating cost, and that higher Federal taxes have added 1.42 cents for each 1,000 cu. ft. of gas furnished.

Petition Filed by Chickasha Company Requesting Increase

A petition has been filed by the Chickasha (Okla.) Gas & Electric Company asking permission to raise the gas rate in Chickasha from $1.30 to $1.85.

Construction Notes

Bellefontaine Plant Will Be Ready for Operation Soon

Henry Szhremser, of Detroit, is in Bellefontaine, Ohio, and started a fire in the new gas plant May 22. It will take a period of about thirty days for the new plant to be dried out, after which it will be put in operation. Mr. Szhremser will remain in the city until the new plant is working.

Absorption Plant to Be Built at Worland

The Petroleum Gas Products Company, a wealthy California concern, with seventeen big absorption plants operating in the older oil and gas fields, has closed a deal through the Victor Wyoming Oil Company that will result in the placing of a half-million-dollar gasoline absorption plant in the Hidden Dome field at Worland.

These people, who are well versed in the value of natural gas products, readily recognized the enormous value of the Hidden Dome as a gas structure. As an indication of the value of these gas wells the absorption people claim that with the present production cut in two the development of the field is barely started; that their absorption plant can pay 10 per cent on four and one-half million dollars. They are putting in their own money and they have nothing to sell.

As a direct result of the coming of the absorption plant, the Victor Wyoming Oil Company has placed the firm of McKee, Johnson & Lewis, known as the Pacific Oil & Gas Company, in the Hidden Dome field. They have taken over some choice acreage on a percentage basis and will start a vigorous campaign of development. This firm will engage in producing, refining, distilling and the carrying of oil, petroleum and natural gas. They will establish agencies and warehouses, as well as storage tanks. The absorption people have made a deal with the Hecla company and have ordered their plant shipped to Worland. They will also start drilling the holdings secured from the Worland crowd. Numerous big interests besides the twenty-seven companies now in the field are negotiating for holdings. The Victor Wyoming Oil Company is planning immediate development of additional acreage recently secured. Altogether the Hidden Dome promises for this summer some active and sensational developments.

Contract Awarded for Koppers Ovens

H. Koppers Company announces that they have been awarded a contract by Jones & Laughlin Steel Company for the construction of a by-product coke plant of 300 ovens. This plant will have a carbonizing capacity of approximately 2,000,000 tons per year, and will replace beehive coking capacity to that amount. The plant will be complete in every respect and will be equipped for the recovery of ammonia in the form of ammonium sulphate, of tar and of benzol and toluol as pure products. The ammonium sulphate and pure toluol from this plant will be sold to the Government for war purposes. The steel company proposes to use the gas in its steel plant operations.

New England Companies Prepare for Increased Gas Sales During Coming Winter

The gas companies in New England are preparing for the increased gas sales that are anticipated during the coming winter, and the Gas Machinery Company, of Cleveland, Ohio, is installing new water gas sets in the works at Westfield, Mass.; Norwich, Conn.; Taunton, Mass.; and Arlington, Mass.

The gas companies are also installing auxiliary apparatus in connection with the water gas machinery so as to insure the continuance of good service to their customers.

THE HUB OIL & GAS COMPANY, Jefferson; capital, $5,000. Incorporators, A. W. Green, C. H. Phelps, G. F. Wolcott, F. W. Stasny and E. C. Lampson.

Even for the Company Serving Small Cities Located in Inland Agricultural Districts the Possibilities for Industrial Fuel Business Are Not Inconsiderable

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summer must be overcome by special inducements for summer consumption, a detail to be worked out later. But I might say that if where I am selling 1,000,000 ft. per day I can sell 10,000,000 ft. per day at a profit of 10 cents per thousand, I would be willing to close my plant for four or five months per year; and you would, too. Figure it out

Disposing of the Coke

The question arises of what we will do with the coke made from such a vast quantity of gas. The problem of disposing of ten or more times the amount of coke you gas men now make, is, no doubt, a serious one, but it can and will be met. There will always be families who cannot afford to heat with gas or else are not on our lines. These people must be taught that, of all solid fuels, coke is the cleanest, cheapest and best the market affords. Verily, with our cities heated with gas and coke "Spotless Town" will be a reality

With distribution system and plant adequate, the question of rate arises, and here we must turn to our electric brethren and base our rate on demand. The question is too complex to go into in this brief paper, but suffice it to say we ought to be able to sell a 500 B.t.u. gas for heating purposes at 40 to 45 cents per thousand and make a profit of 10 cents in ordinary times

Shortcomings in Means of Utilization

With rate established, plant built and distribution system modified, but one obstacle remains, and that is the proper appliance, and here we pause, and well may we pause, because the question is the most serious that confronts the gas industry to-day. The use of positive pressure air in a gas burner was first installed in the New Orleans mint about forty-five years ago, and since that time there has been but very little improvement or change in its use, with the exception of surface combustion and the proportional mixing of gas and primary air before it reaches the burner. The burners on the market at the present time for the present needs are satisfactory, but I fear that the *laissez faire* policy of the gas industry will allow them to await the necessity of further progress until our friends, the enemy, further encroach on the heating field. Truly, "necessity is the mother of invention," and when we realize the necessity of an economical gas-heating system we will get it.

Sioux City Company Takes Stand That Unless It Can Put in an Installation That Will Be Successful It Is Better to Put in Nothing at All

By H. R. Stephenson
Sioux City Gas & Electric Company, Sioux City, Iowa

In the vicinity of Sioux City the industrial possibilities for gas are very limited. Outside of the packing industries there are none, Sioux City being a jobbing and distributing point.

In 1913 the first real efforts were made to convert the coal kitchens in the leading hotels into all-gas kitchens. We felt that if this end could be accomplished the smaller hotels, restaurants and lunchrooms would become converted to the use of gas entirely in their kitchens.

Sioux City has four leading hotels and two clubs. As a matter of reference we will call these hotels Nos. 1, 2, 3 and 4 and clubs Nos. 1 and 2.

In 1913 hotel No. 1 was contemplating discontinuing their combination gas and coal ranges and installing coal ranges. After numerous calls and the submitting of what was thought convincing data they informed us that regardless of all this data on gas ranges they were going to install coal ranges, but at the last moment we were given the privilege of making a trial installation of four sections of hotel ranges, which resulted in a permanent installation, and this hotel has one of the best equipped all-gas kitchens for a hotel of its size in the country. Since that time the management of this hotel has changed hands and they have purchased several hotels in nearby towns, in which are being installed all-gas kitchens.

From 1913 to 1917 little progress was made. All-gas kitchens were installed in the two clubs.

In 1917 we were fortunate to have with us for a few days at two different times a hotel range salesman, who made two trial installations in hotels 3 and 4. Before the trial period had expired we received checks for both of these installations. Since that time hotel No. 4 has ordered additional range equipment.

Shortly after installations were made in hotels 3 and 4, hotel No. 2 asked for estimates and data regarding range equipment. This information was submitted, and in addition to this we made a careful survey of their kitchen with the view of rearranging their entire equipment. Their kitchen at that time was very poorly arranged, cooks and kitchen help were in each others way; in fact, in order to make a successful installation it would be necessary to make this rearrangement. After they had gone over the gas-range data we were assured of the business until the cost of rearrangement of the kitchen was submitted. This suggestion was not looked upon very kindly, and we were informed that the present arrangement was satisfactory, and all they wanted was information regarding gas ranges only. Of course we were disappointed at this attitude, but we felt that if an installation was made it should be one that would reflect credit on our company as well as the hotel. This installation was practically considered dead until a few weeks later our industrial salesman was called in and was told that they had reconsidered our proposition, and in a few weeks the rearranging started and a complete up-to-date installation was made. This hotel is again enlarging their dining room and kitchen, and we are receiving our share of the additional business.

The following data probably will be interesting to most of you:

Hotel	Meals Served Per Month	Monthly Consumption
1	28,000	249,000 cu. ft.
2	27,000	230,000 cu. ft.
3	12,000	210,000 cu. ft.
4	9,000	92,500 cu. ft.

Poor Housekeeping Responsible for Most of the Fires in Gas Plants

(*Continued from page* 540)

see the small number who knew how to operate them. Extinguishers should be kept filled with liquid when not in use.

Chemical Fire Extinguishers

Chemical fire extinguishers are invaluable in extinguishing fires, and should be liberally provided, maintained in good condition, and bear the label of approval by the Underwriters' Laboratories. All extinguishers should be conspicuously located, preferably suspended on posts or walls about 5 ft from the floor, and should be systematically spaced throughout the entire building on floors requiring them. The carbonic acid gas extinguisher (hand type) should be tested by actual operation, emptying the contents as at a fire, and then immediately refilling and recording the date of recharging on tag provided for that purpose. They should be recharged at least once a year. At time of inspection, carefully examine hose, hose nozzle and connection, observing whether or not the latter shows signs of corrosion, and if so, provide a new one. A quantity of sulphuric acid and bicarbonate of soda for prompt recharging of extinguishers should be kept on hand.

Care should be taken that extinguishers are not placed in buildings where they might freeze, and during extremely cold weather it is advisable to group them in a room sufficiently heated to prevent freezing. Clothing or other material should not be placed on extinguishers, and passageway should be kept clear in front of them.

Water Casks and Pails

Inspection should be made to note condition of water casks and pails as regards decay, leaking or rust and cleanliness of contents. All casks and pails should be well painted and completely emptied, cleaned and refilled at regular intervals. So much depends on climatic conditions and temperatures that it is impossible to determine just how often they should be filled, but a careful inspection on the part of the plant inspector may insure their being full at all times. Water pails in our plant are inspected weekly.

Casks and pails should be placed in readily accessible and prominent locations. If a room or shop is equipped with pails only, they should be suspended from brackets made fast to the walls or posts and not less than 5 ft. from the floor. If all pails are painted a bright red and marked "For Fire Only," there is less danger of the employees using them for domestic purposes. If there is any likelihood of the water freezing in winter, there should be dissolved 1½ lb. of common salt or calcium chloride to each gallon of water.

Sand Pails

The value of fine sand as a means of extinguishing fire in burning liquids, by smothering flame, is recognized. Scoops should be provided for each sand pail, and foreign matter should not be placed on top of the sand.

In the proper maintenance of boiler and engine rooms, the following features should receive attention:

1. Examine setting of boilers and clearances at sides and top.

2. Fuel should not be stored against boiler walls or in wood enclosures. Certain fuels are liable to self-ignition.

3. Ashes should not be stored nor dumped upon a combustible floor. If not conveyed from furnace by a conveyor system to outside dump, they should be placed in metal barrels and removed from the boiler room daily.

4. Boilers should be cleaned at proper intervals, should never be permitted to carry too low water level, nor should they be filled with cold water while in a heated state.

5. Boiler and engine room should be occupied exclusively for power purposes and be free from unnecessary storage of combustibles, refuse or oils. Daily supply of oils necessary in engine room should be kept in metal cans, with metal drip pans.

6. Top of boilers should not be used for the storage or drying of combustible material, such as lumber, workmen's clothes, or odds and ends.

7. If floor of engine room is of wood, it should be kept free from oil and grease, and metal drip pans provided where necessary.

Steam Boiler Explosion Precautions

Steam boilers are subject to explosion, which is frequently the result of deterioration through neglect, or the lack of careful examination before starting fires after a period of inaction. While expert inspection is desirable, intelligent care and understanding of these devices are possible to every one. Boilers out of commission in summer should be overhauled at the time they are shut down, to insure proper operative condition when fires are again started.

The following points should receive consideration:

1. Before filling boiler with water, every accessible part of it, both internally and externally, should be cleaned.

2. Take down smoke pipe and remove soot from it; in case of tubular or flue boilers, clean out the tubes or flues. When replaced, examine the joints, making sure of their tightness, giving attention also to supports.

3. Examine brickwork of setting; see that external surface of the boiler is clean and in good repair, and remove all soot, dust and ashes from grates, etc.

4. See that gauge cocks and connections to water column are clear of sediment and are operative; if necessary, temporarily remove them to determine this.

Suggestions to Eliminate Fire Hazards in Gas Industry

1. Proper receptacles for clean waste should be provided, for while it is not a spontaneous ignition hazard, it is objectionable for the same reason that any packing material is undesirable, as sparks may lodge in it and smolder for some time before breaking out into flame.

2. Candles burned to a stub should not be allowed to stand on woodwork. Metal holders should be provided.

3. Asbestos boards should be placed on wooden ceilings over gas lights.

4. Swinging gas brackets should not be allowed to come in contact with wood.

5. Broken windows in purifier house should be reglazed to prevent sparks entering from the outside.

6. "No Smoking" signs should be posted on each entrance to purifier house. These signs ought to be placed on all doors, whether in use or not.

7. Gas heaters to be used permanently should be connected with iron pipe.

8. Excelsior and loose paper should not be allowed to lie in yards around buildings, as there is a danger of sparks from engines falling into them.

9. Greasy and oily waste is subject to spontaneous ignition, and the greatest care should be taken in its disposition. Unless it is immediately burned after using, all waste should be deposited in standard waste cans. The construction of the waste can is of vital importance, and non-standard cans are of but little value. Waste cans should be of approved type and in sound condition, and lids operative and self-closing, legs secure and handles in place. There should be an ample number of waste cans provided and conveniently placed for use of employees.

10. Metal polishes, which are highly combustible, containing large quantities of either benzene or gasoline, should not be used.

11. Employees should be allowed to use safety matches *only* in their work.

12. Substantially constructed and properly ventilated metal lockers for employees' clothing should be a requirement of every establishment. Sanitary measures alone demand this. The old wood closets, lockers and enclosures, liable to be used as a catch-all for discarded and greasy garments, are things that an up-to-date employer will not tolerate.

(a) Each employee should have the exclusive use of a metal locker, and should be instructed to use it, keep it clean and free from dust and odd material.

(b) Lockers should preferably rest on a non-combustible floor and away from partitions other than brick, and should be kept in rooms designed for them.

13. The custom of smoking tobacco in various forms is almost universal among men, and is one that is impossible to eliminate. Many fires owe their origin to smoking and to carelessness in the use of matches, disposal of ashes and burning tobacco. Frequently, in industrial plants, smoking can be safely permitted at noon, in certain quarters, such as locker rooms, boiler rooms, blacksmith shops, etc. Men will smoke, and if they have a time and place to do so, it can be controlled.

14. Open barrels and boxes containing straw and excelsior should not be allowed to stand around. The straw or excelsior should be removed or a cover for barrel or box provided.

15. Pipes conveying main supply of steam should be wrapped with magnesia or asbestos covering, and where passing through wood partitions should have a clear space of at least 1 in. Steam-heating pipes should rest on metal hangers or supports, and where passing through combustible floors or partitions, they should have at least a ½-in. air space from combustible material and a metal collar or thimble provided. Steam radiators and steam pipes must not be used as places on which to dry rags, clothes or other combustible material.

16. All electric fans, adding machines, etc., which are ordinarily used in commercial offices, should be connected with reinforced cord instead of the twisted pair extension cords.

17. The greatest care should be taken in the storing of material in storerooms. A passageway of about 2 ft. should be left between the material and outside wall, and particularly in front of fire escapes. A clearance of 18 in. should be left between the top of the material and sprinkler heads of automatic sprinkler system, so that the water can spread freely in case of fire.

18. A well-ventilated fireproof vault, if possible, should be provided for paint storage, and where this is not feasible the room used for this purpose should have a concrete floor and should be well ventilated, both at the floor level and overhead. Oils, thinners, etc., should always be kept in metal tanks or cans. Metal drip pans should be placed under all faucets and should be frequently and systematically cleaned.

19. Window ropes on windows in front of fire escapes should be kept in good repair.

20. Pentane used for testing purposes should be buried in a pit underground.

A Portable Industrial Fuel Gas Installation

To get our customers acquainted with the uses of gas and its many advantages is often a difficult task, especially in the beginning, writes J. C. Gapen in *Public Service Lumen*. Yet after a start is made the effects gas obtain often induce attempts to use it in places where another fuel might be somewhat cheaper in the first cost.

An instance of the above was brought to the attention of the writer a short time ago. We secured a customer in a concern dealing in second-hand machinery, consisting of locomotives, cars, cranes, etc. This customer repairs a large number of small locomotives, including flues in their boilers. After persistent effort we were finally permitted to deliver a small forge which was suitable for heating rivets, tempering tools or heating ends of boiler tubes. After its delivery, the customer for some time ignored it. Finally one day in desperation we got everybody together on the deal, connected up the forge, and showed the customer what it would do. In less than a week we called again, and lo, and behold, the forge with motor and blower was mounted on a small truck and the whole plant was piped with a gas and electric connection on each post so that the forge could be moved to the place most convenient. On account of size of work it is not always possible to take the work to it, so they took the forge to the work.

One of the operations performed in this plant involves the removal and replacing of the large steel tires used on the wheels of locomotives. Success demands the application of a quick and high heat to the tires. This expands the tire before the wheel proper gets hot and thus the tires slip on or off easily.

It had been the practice to effect the removal of these tires by means of heat created by a gasoline flame. Generally about half a day was consumed in handling a set of tires from one engine by this method. There are some very capable men in the organization of this concern, and they one day tried gas. It took them just six minutes to get one tire off, and on a six-wheel engine thirty-six minutes for a job that formerly consumed half a day. Needless to say the popularity of gas is established in this plant.

That indeed is almost invariably the result which follows the introduction of gas in an industrial plant, and our customary experience in each case is an immediate increase in the demand.